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THE FARM ON THE GRAVOIS

HISTORIC STRUCTURES REPORT

Ulysses S. Grant National Historic Site
St. Louis, Missouri

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Ulysses S. Grant National Historic Site
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Recommended:
Superintendent, Midwest Support Office
Date

Concurred:
Superintendent, Ulysses S. Grant NHS
Date

Approved:
Regional Director, Midwest Region
Date

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Ulysses S. Grant National Historic Site
St. Louis, Missouri

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THE FARM ON THE GRAVOIS

HISTORIC STRUCTURES REPORT

Main House
Stone Building
Barn
Other Structures

by
Alan W. O'Bright

Ice House
Chicken House

by
Kristen R. Marolf

Ulysses S. Grant National Historic Site
St. Louis, Missouri

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EDITORIAL NOTES AND COMMON ABBREVIATIONS

The author elected to print quotations without the use of *sic* for misspellings present in original sources.

The following common abbreviations are used throughout the text without introductory full citation:

Abstract	First American Title Company Abstract Collection. Ulysses S. Grant National Historic Site, St. Louis, Missouri, n.d.
ATC	ATC Environmental Inc. *Asbestos Assessment Survey Prepared for: National Park Service, Ulysses S. Grant National Historic Site*. St. Louis: October 16, 1991.
ESE	Environmental Science & Engineering, Inc. *Phase VII: Dendrochronology Study, Ulysses S. Grant National Historic Site, St. Louis, Missouri*. St. Louis: 1993.
HA, *MEP*	Heideman + Associates, Inc. *Utilities, Mechanical and Electrical Treatment Recommendations and Building Code Review, Main House and Stone Building, Ulysses S. Grant National Historic Site, St. Louis, Missouri*. June 1, 1994.
HA, *Structural*	Heideman + Associates, Inc. *Structural Report, Ulysses S. Grant National Historic Site, St. Louis, Missouri*. May 23, 1994.
JDG, *Memoirs*	Grant, Julia Dent. *The Personal Memoirs of Julia Dent Grant [Mrs. Ulysses S. Grant]*. Edited by John Y. Simon. Carbondale, Illinois: Southern Illinois University Press, 1975.
USG, *Papers*	Grant, Ulysses S. *The Papers of Ulysses S. Grant*. Edited by John Y. Simon. 20 vols. to date. Carbondale, Illinois: Southern Illinois University Press, 1967-1995.
KSL, *White Haven*	Little, Kimberly. *Ulysses S. Grant's White Haven: A Place Where Extraordinary People Came to Live Ordinary Lives, 1796-1885*. St. Louis: Ulysses S. Grant National Historic Site, National Park Service, 1993.
UBC	*Uniform Building Code*. Whittier, California: International Conference of Building Officials, 1985.
UCBC	*Uniform Code For Building Conservation*. Whittier, California: International Conference of Building Officials, 1987.

ULSG	Ulysses S. Grant National Historic Site
USG	Ulysses S. Grant
WE	William Elrod, White Haven tenant, 1867-1873
WUTA	Washington University Technology Associates. *Architectural Paint Analysis of Ulysses S. Grant National Historic Site, St. Louis, Missouri*. St. Louis: March 10, 1993.

ACKNOWLEDGEMENTS

Research information for this document could not have been possible without the assistance of many individuals. Former site owner H.A. "Bill" Wenzlick was invaluable in providing insights and details in the pre-1940 condition and appearance of the house. His family photographic collection and recollection of work performed by himself, his father Delbert, and grandfather Albert greatly helped in sorting out formative events. Thanks also go out to Bill's son Del for allowing access to his grandfather's and great-grandfather's collection of movies.

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Local architect Jack Luer and preservation specialist Jesse Francis proved to be valuable assets to the project. Their experience with many regional building preservation projects, especially expertise with French Colonial structures, gave us a starting point in researching many aspects of the site.

Historian Esley Hamilton provided much needed direction for sources of research material.

Laura Johnson initially volunteered her services to prepare HABS documentation for the Ice House, and was later hired full time to prepare existing condition, design development, and construction drawings to AutoCAD. Her enthusiasm and computer expertise greatly accelerated the timetable for completing the drawings.

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Soil Consultants, Inc.
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Wallpaper analysis.

DIVISION I - INTRODUCTION

Four developmental periods are seen in the 200-year evolution of European occupation of the White Haven property; initial occupance, progressive growth, static occupation, and contemporary conditioning. Initial occupance refers to the first permanent settlement of the property.[1] The first two documented owners of the site, Hugh Graham and James Mackay, have backgrounds which characterize them as early settlers who may have established the first rudimentary shelter on the property and set in motion early agricultural use of the land.

The site then experienced a period of progressive growth beginning with the occupation of William Long in 1808. It is believed that Long and his family occupied a cabin on the property until beginning construction of the timber frame, two story house around 1816. Apparently, Long never finished, and did not occupy the new house. Theodore Hunt finished the house expanded it with an addition around 1818, and then numerous additions and renovations by Frederick Dent until sale of the property to Ulysses S. Grant in the mid-1860s. While improvements were constantly being made to the house, other structures were constructed on the property in response to increased cultivation of the land to support family, laborers, tenants, and livestock. By 1875 there were at least two barns on the property in addition to a springhouse, an icehouse, and at least one shed, perhaps chicken and pig houses, and most certainly an outhouse or two. The existence of slaves quarters or cabins are mentioned in correspondence throughout the nineteenth and into the twentieth century, but as yet there is no firm documentation of their appearance nor their precise location.

Large construction projects at the plantation ceased with Grant's virtual abandonment of White Haven around 1875, soon after conviction of several prominent St. Louis people in what is known as the Whiskey Ring Scandal. Grant continued to own the property until 1885; it is unknown how many times he visited his property. With that, the farm settled down into 40 years of static operation. Luther Conn maintained the farm and raised horses with his acquisition of White Haven in 1888. The property was sold to land speculators in 1905, a period in which the buildings decayed as a result of abandonment.

Acquisition of the farm by Albert Wenzlick in 1913 initiated a new era of use for the site, contemporary conditioning. Whereas the land had principally been cultivated throughout the nineteenth century, the site was used as a self sustaining residential summer retreat for Albert and his family. But substantial work was required to improve the primitive state and deteriorated conditions before the new owner could occupy the house. Albert set to work renovating the building for living standards concurrent with the time. He repaired foundations, walls, floors, and roofs, and installed contemporary conveniences such as bathrooms, electrical outlets, and a centralized heating system. He improved the maintained the building, but effected no work that significantly altered the historic integrity of the house.

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[1] 1. Stephen M. Knight, *Architectural Context Study, The Nichols Farm, Ozark National Scenic Riverways, Missouri* (Omaha: Midwest Regional Office (USDOI), 1986), 10 (hereafter cited as Knight, *Study*).

Technology and a fast paced standard of living soon caught up with the house. The acquisition of the property by Delbert Wenzlick about three years after father Albert's death in 1937, resulted in some of the most drastic alterations to the building since Dent ownership. Not satisfied with elementary conveniences, Delbert proceeded to transform the house into a comfortable year-round residence wrapped in old world charm. Economic rather than historic considerations may have prompted Delbert to remove portions of the house that had survived up to 120 years of service. Foundations and walls were moved and removed, historic floors concealed, and new windows, doors, a modern kitchen, and several bathrooms were added. According to local tradition the Main House is the first residence in St. Louis County equipped with a central air conditioner. Site alterations were also made. Portions of the barn were demolished prior to being moved in response to encroaching housing developments. The Stone Building was converted into a garage and a workshop constructed for the tools that maintained the site. The driveways were advanced and paved, and the creek bed rerouted. In the meantime, the surrounding land that had for so long supported woodlots, cultivated fields, and orchards was developed into tracts of housing.

This document interprets the physical history and existing condition of the five remaining historic structures located at Ulysses S. Grant National Historic Site. The goal of this comprehensive research project is to provide information to effect wise decisions in the development of treatment proposals for the eventual restoration, preservation, and stabilization of these structures. Interpretive period and structural treatment are dependent upon several factors including anticipated use, quantity of intact historic material, and the availability of dependable historic and graphic documentation. This document presents treatment alternatives for each of the historic structures which were concurrently consideration by the site's General Management Planning (GMP) team. The selected treatment alternatives are more fully explored and detailed in the Design Development portion of each division.

The history of White Haven property ownership is extremely complex, involving poorly documented early land surveys (the use of meets and bounds to describe property lines), questionable transactions, partial land sales and purchases, and ownership disputes settled in court. Even at this writing there is disagreement as to rightful possession of the unused railroad right-of-way at the western border of the Historic Site. Only less than 10 acres remain of the original 1,000 plus acre tract of White Haven farm land accumulated by Ulysses Grant. A detailed property title search and corresponding ownership history of the entire expanse of the Grant land tract will require an enormous research effort that is beyond the scope and time schedule of this report. Because of these complexities, this document addresses only ownership of the property that now comprises the Ulysses S. Grant National Historic Site. It is believed that enough information has been accumulated thus far to make sound determinations concerning the construction and modification of the structures, and persons who have been associated with them.

Each of the extant historic structures is comparatively analyzed to demonstrate typical regional architectural design, detailing, and construction techniques. This research tool was especially valuable in determining the initial function of what is now deemed the Ice House, and in an attempt to date specific stylistic building components such as the front door to the Main House.

Comparative research is also extended to the local and regional use of building materials or elements such as wood, plaster, cook stoves, and barn equipment.

A thorough condition analysis was performed on each building to assess structural and historic fabric integrity. Some post-1940 finishes were removed to access areas in need of structural investigation. Extensive materials analysis was relied upon to provide information on historic building chronology, fabric integrity, structural soundness, and fabrication dates. Small samples of mortar, plaster, wood, and paint were removed from many areas of the buildings for detailed analysis. In addition, a Radiocarbon C_{14} test was run in an attempt to corroborate a previously prepared dendrochronology study.

Materials analyses were very important in this project. As the principal twentieth century owners, the Wenzlick family salvaged lumber and millwork from their renovation work and incorporated it into other projects on site. Some the millwork may have also come from structures off site. Their impressive personal workshop attested to their ability to fabricate moulding profiles carefully matched to historic millwork. The historic integrity of existing millwork had to be determined before treatment decisions could be rendered.

A detailed engineering analysis was initiated to assess structural weaknesses and prepare treatment remedies sympathetic to the historic character of the buildings. The analysis also investigated the seismic stability of the Main House, Stone Building, and Barn. The site lies within the influence of the New Madrid Seismic Zone, or Seismic Zone 2.[2] The last major series of earthquakes occurred during a two month period spanning the years 1811 and 1812. It is predicted that an earthquake in magnitude of 8.0 on the Richter Scale will not happen for another 200 years. However, moderate earthquakes occur on an average of approximately 75 to 100 years.[3] Since the last moderate earthquake of magnitude 6.2 occurred in 1895, the probability is high that the St. Louis area will suffer damage from a moderate earthquake.[4] A subsurface test consisting of three borings around the house furnished structural investigators with soils information useful for the seismic evaluation.

Although a number of historic paintings, drawings, and photographs dating as early as 1840 exist for the site, there will always be questions concerning certain appearance details. Trees always seem to conceal important elements in photographs. However, early Wenzlick photo collections combined with 1940 Historic American Building Survey documentation gave enough information for the graphic reproduction of exterior elevations of demolished portions of the house with the assistance of computer aided design. The timely availability and of this software greatly improved productivity and accuracy in the final development drawings.

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[2] *Uniform Building Code* (Whittier, California: International Conference of Building Officials, 1985), 135. Zone 2 corresponds to moderate damage.

[3] William Atkinson, *The Next New Madrid Earthquake - A Survival Guide for the Midwest* (Carbondale, Illinois: Southern Illinois University Press, 1989), 1 (hereafter cited as Atkinson, *New Madrid*).

[4] Atkinson, *New Madrid*, 27.

All drawings for this project have been generated on AutoCAD. The 1991 HABS drawings and Main House interior elevations were initially hand drawn, and then scanned to AutoCAD. From these base drawings grew hundreds of extremely detailed drawings that could not have been accomplished in such a brief time span without the use of AutoCAD and people experienced in the operations of such software and computers. Without a doubt, computer aided drawing saved approximately two additional years of project time had the drawings been produced by hand.

This document would be incomplete without the participation of historic research and archeological interpretation. Considerable effort was made to locate documents and interview persons previously affiliated with the site to assist in the determination of an accurate historic building chronology. Archeological excavations concentrated on immediate questions concerning physical characteristics of removed portions of the Main House and Stone Building.

During final layout for this document in 1995, archeological mitigation work proceeded in the basement Winter Kitchen in preparation for construction work. At that time it was anticipated that little, if any, period artifacts or architectural remains would be found based upon the findings of a test pit excavated in front of the fireplace hearth in 1993. However, additional test pits revealed an enormous wealth of historically significant information on the mid-nineteenth century use of that room. Specifically, the archeological artifacts suggested the activities of slaves who served the Dent family prior to the Civil War. Preliminary analysis of archeological evidence suggests a far more complex use for the room than originally anticipated. As a result, the National Park Service made a determination during Summer 1995 that the Winter Kitchen would be accessible to visitors. This revision required a reassessment of visitor routing as previous designs did not call for the Winter Kitchen to be accessible to the public due to building code difficulties. Therefore, the ultimate use drawings for the Main House presented in this document do not reflect this revision.

Discoveries made during future construction work, such as in the aforementioned paragraph, may require revisions to design aspects indicated in this document. Any previously undocumented conditions and subsequent design revisions will be documented in post-construction reports. The design revisions will also be evaluated for the necessity for Section 106 compliance review.

While there will always be questions affecting issues of historic appearance and authenticity with respect to certain aspects of this project, it is believed that enough information has been assembled to make reasonable and sound decisions for treatment of the historic structures. However, the research must not end with approval of this document. Most certainly, physical evidence will be uncovered during future construction and archeological work that may revise theories presented in this document on historic building chronology of the house. And it is believed that there has to be more than the hand-full of nineteenth century photographs of the house given its prominent association with a United States president. Because the National Park Service is now charged with preserving the site in perpetuity, it is reasonable to assume that time will be no barrier in eventually locating additional research materials.

DIVISION II - MAIN HOUSE (HS-1)

INTRODUCTION

Soon after documentation and physical investigation work commenced on the house during Summer 1991, it was quickly realized that a substantial amount of renovation work had been completed since 1940 that resulted in the destruction of two room additions and a porch, the loss or compromise of interior finishes, and the shuffling of salvaged doors and windows. To that end detailed interior finish, door, and window schedules were compiled to assist in the resolution of the historic integrity of specific components and systems. Paint analysis provided information not only on color schemes, but was also used to comparatively determine the historic integrity of individual components and determine the relative date of installation of components and systems. Mortar, plaster, and wood analysis provided additional information on the historic materials of construction which will be important in developing treatment recommendations.

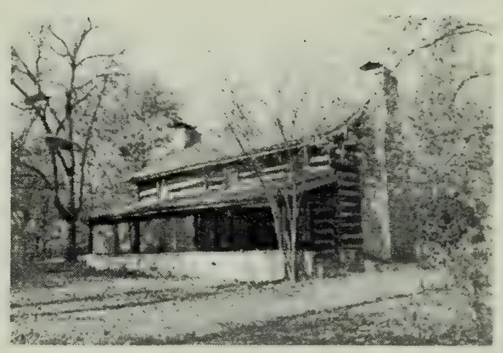
Historic American Building Survey (HABS) drawings were prepared in 1991 to provide a starting point for investigation work. Detailed drawings were prepared of all interior spaces to precisely pinpoint sample locations. Each room, door, window, and fireplace was given an identification mark to assure that all information was accurately delineated and also to assist in sorting through the history of moved doors and windows.

The house has been added to and renovated periodically since initial construction around 1818. As with most nineteenth century structures of agrarian origin, dates of modifications and additions were rarely recorded. This study uses historic graphic documentation, personal records, research of building and construction technologies, and existing physical evidence to define as best as possible the date or period in which substantial changes took place on the structure. To assist the reader in the identification of additions to the house over time, each of the additions is referenced with a name related to the person or family responsible for the modification or simply with an ordinal direction followed by the term "wing" or "addition." The following schematic plan of the house keys those names to the specific portions of the house.

The house is referred to as the "Main House" rather than "White Haven" throughout the document. White Haven has been used interchangeably throughout most of the nineteenth and the twentieth century to describe the whole property and this one particular structure. To dispel any confusion which may arise between this similar name between the house and the property, Main House was chosen because there yet exists a second residence, and several other residential structures, more or less documented, have existed on the property for the past two centuries.

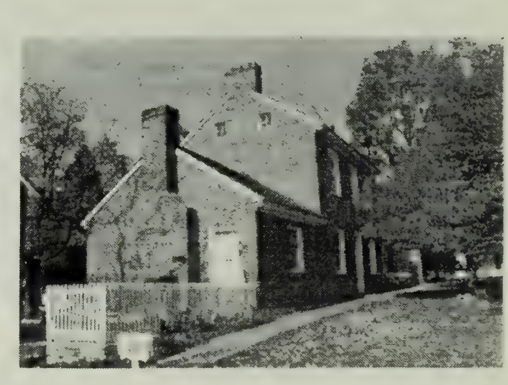
Several historic structures within the St. Louis region will be referenced throughout this document for comparison with the Main House at White Haven. These structures were used to date specific portions or components of the structure and give credence to stylistic features that exist or may have existed on the house prior to substantial renovation work that has left only circumstantial physical evidence. Some of the structures used in the comparative analysis have been restored or renovated; one was completely dismantled and is awaiting reconstruction at another site.

William Long House
9385 Pardee Road
Crestwood, Missouri



Responsible for initial construction of White Haven, William Lindsey Long went on to construct two more houses in the St. Louis area. His third house is but one-and-one-half miles west of White Haven. The one-and-one-half story house is constructed of horizontal logs, one room deep and two rooms wide. It is believed that the eastern half of the house was constructed in 1820, and then the western half built soon thereafter.[1] The house has been in the domain of the St. Louis County Parks and Recreation Department since 1975. The most notable characteristic about the Long log house is its similarity of plan dimensions, room layout, and chimney construction in comparison to the Main House at White Haven.

Thomas Sappington House
1015 South Sappington Road
Crestwood, Missouri



This house was constructed in 1808 by Thomas Sappington, a noted pioneer of St. Louis County. Although the house is built of hand made bricks, its room arrangement, plan dimensions, and architectural elements details are similar to those that exist or may have existed at the Main House. The house was restored in 1966 and is currently operated as a house museum by the Crestwood Historical Society.[2]

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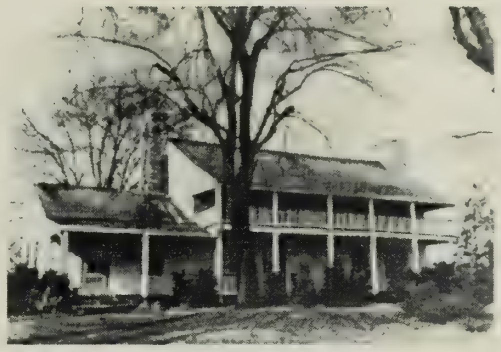
[1] Esley Hamilton, "National Register of Historic Places Inventory - Nomination Form (William Long Log House)" (Washington D.C.: U.S. Department of the Interior, February, 1978), Item 8, Page 2.

[2] Nancy B. Breme, "National Register of Historic Places Inventory - Nomination Form (Thomas J. Sappington House)" (Washington D.C.: U.S. Department of the Interior, May 6, 1974), Item 7.

Zephaniah Sappington House

This house was constructed around 1815 and is described as "...one of two important two-story galleried pioneer houses in St. Louis County;" the other house which is referenced is the Main House at White Haven.[3] Unfortunately, the house was completely dismantled around 1990 and replaced with an apartment complex. The house awaits reassembly at a museum park in St. Charles County. Fortunately there are enough photographs to at least make comparison of massing, window, gallery, and chimney construction to the Main House. The Zephaniah Sappington house was so similar in appearance to White Haven that care must be taken so as not to confuse photographs of the two structures.



Horn Residence
1827 South 9th Street
St. Louis, Missouri

This two-and-one-half story house in the Soulard area of St. Louis city is believed to have been constructed around 1840. Although the character and certainly the urban nature of the structure has little relevance to rural White Haven, its Greek Revival front door and chimney piece is discussed in this document. The house is privately owned.

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[3] Esley Hamilton, "National Register of Historic Places Inventory - Nomination Form (Zeqhaniah Sappington House)" (Washington D.C.: U.S. Department of the Interior, December, 1979), Item 8.

PART 1: DEVELOPMENTAL HISTORY

HISTORIC PHOTOGRAPHS AND ILLUSTRATIONS

The following figures are reprinted from photographs, engravings, and paintings and are referenced frequently throughout Division II. These illustrations and photographs span the period between 1840 and 1949, and are chronologically ordered as adeptly as possible, given the present knowledge of the date of the photographs and illustrations. Existing conditions drawings are located in their appropriate text section.

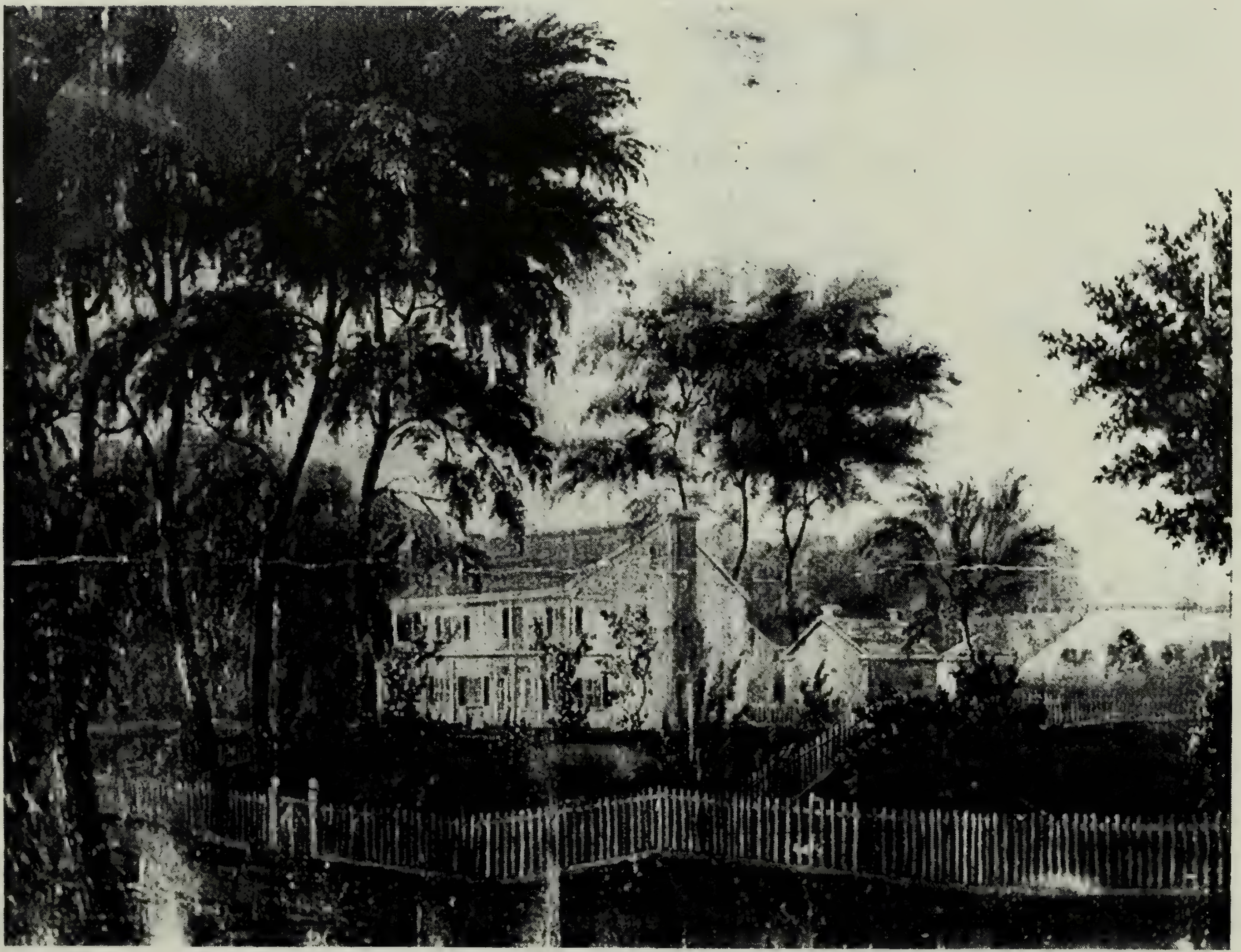


Figure 2.1 - "White Haven, the House in Which and Where I was Born--August 29, 1816." the earliest known illustration of the Main House shows the two story portion of the house constructed by Long, a portion of the West Wing, what appears to be a structure in the location of the Hunt Addition, the Stone Building, and what is believed to have been the Ice House as it appeared at that time. (Circa 1880 albumen print of circa 1840 painting reprinted by permission of the Missouri Historical Society).

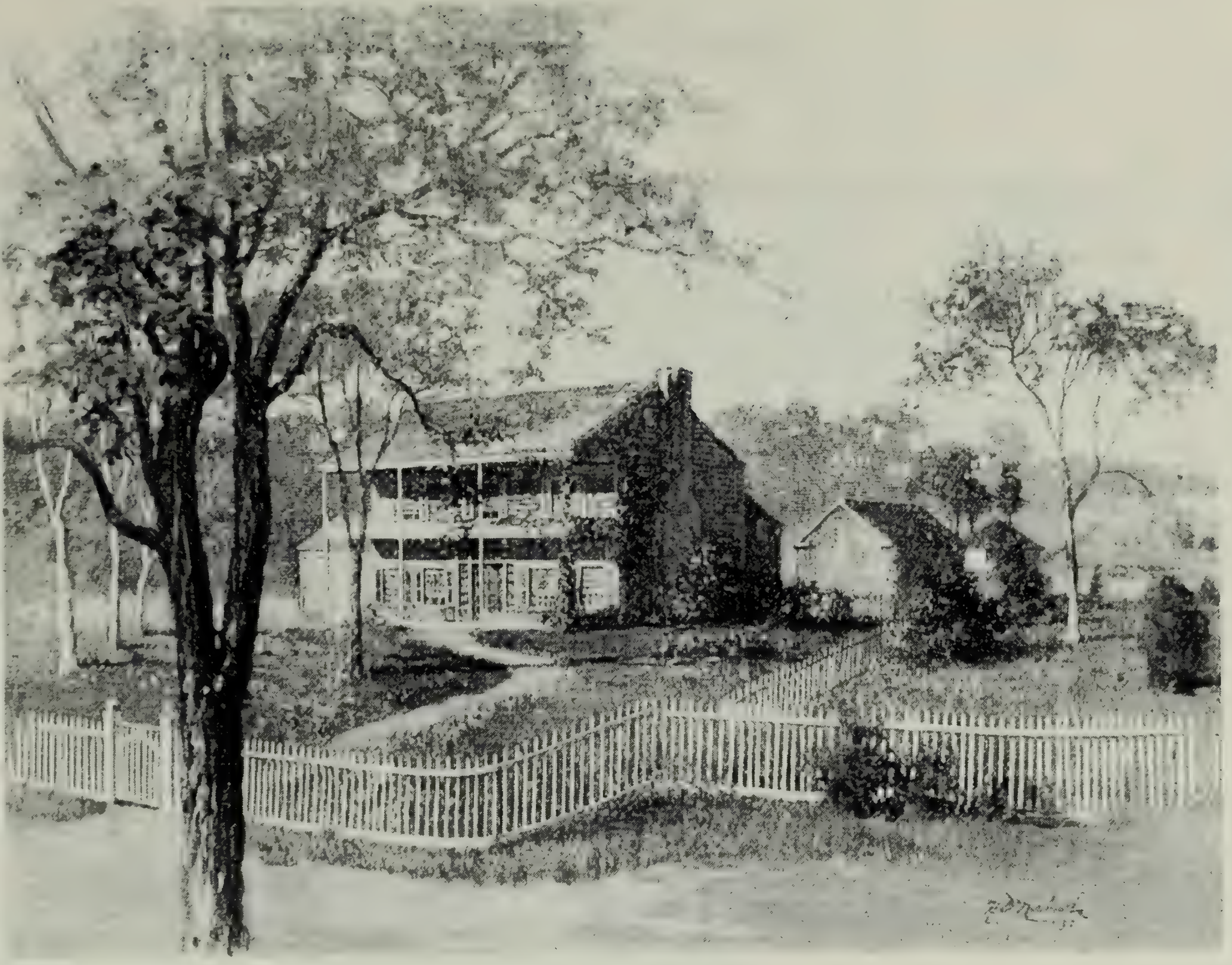


Figure 2.2 - "'Whitehaven' the Dent Homestead near St. Louis, Missouri. Redrawn from an Old Drawing Owned by Mrs. U.S. Grant." This illustration was copied from the 1840 painting seen in Figure 2.1, and shows many of the same features in altered form. (Undated print reprinted by permission of Missouri Historical Society).

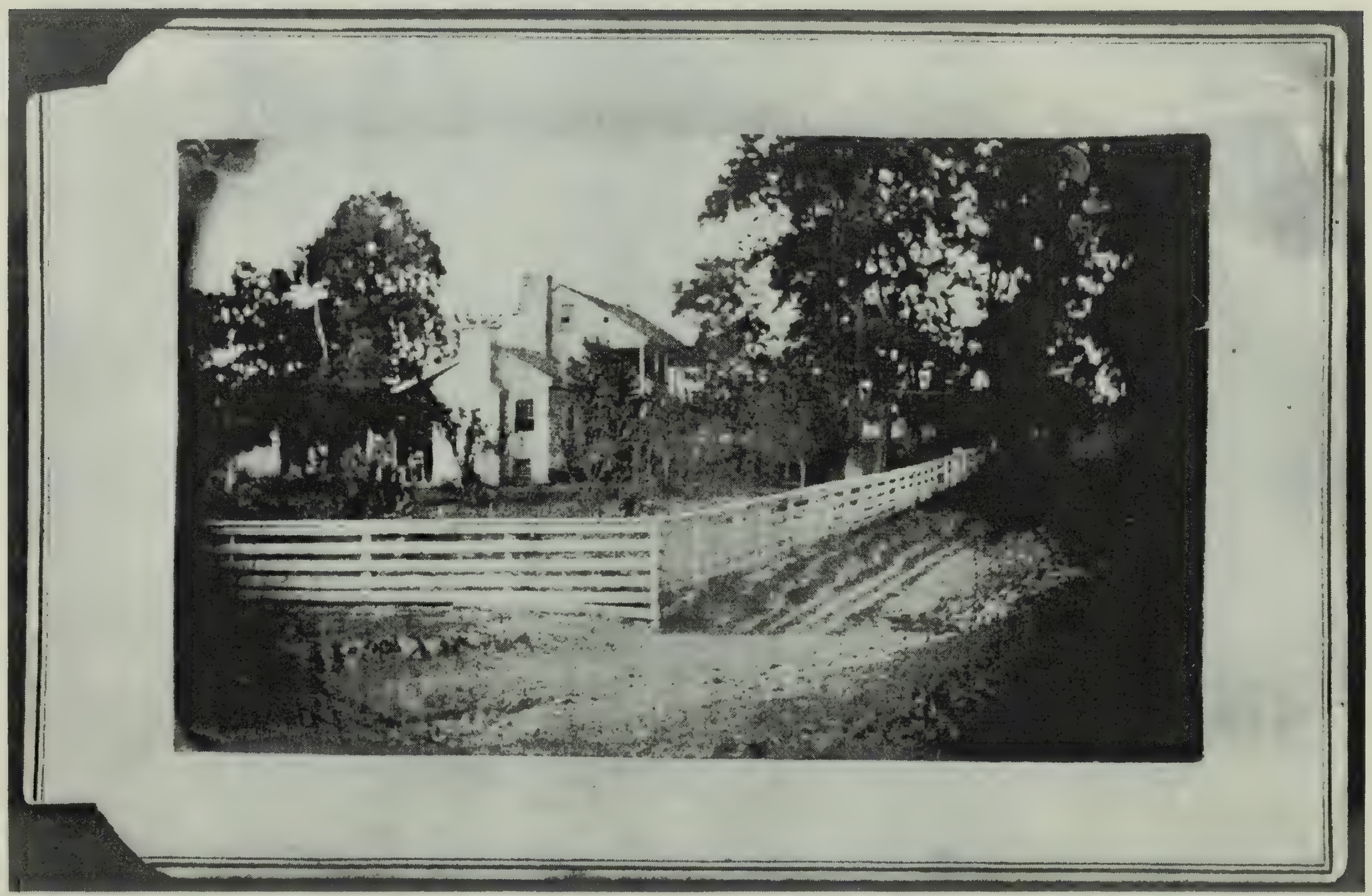
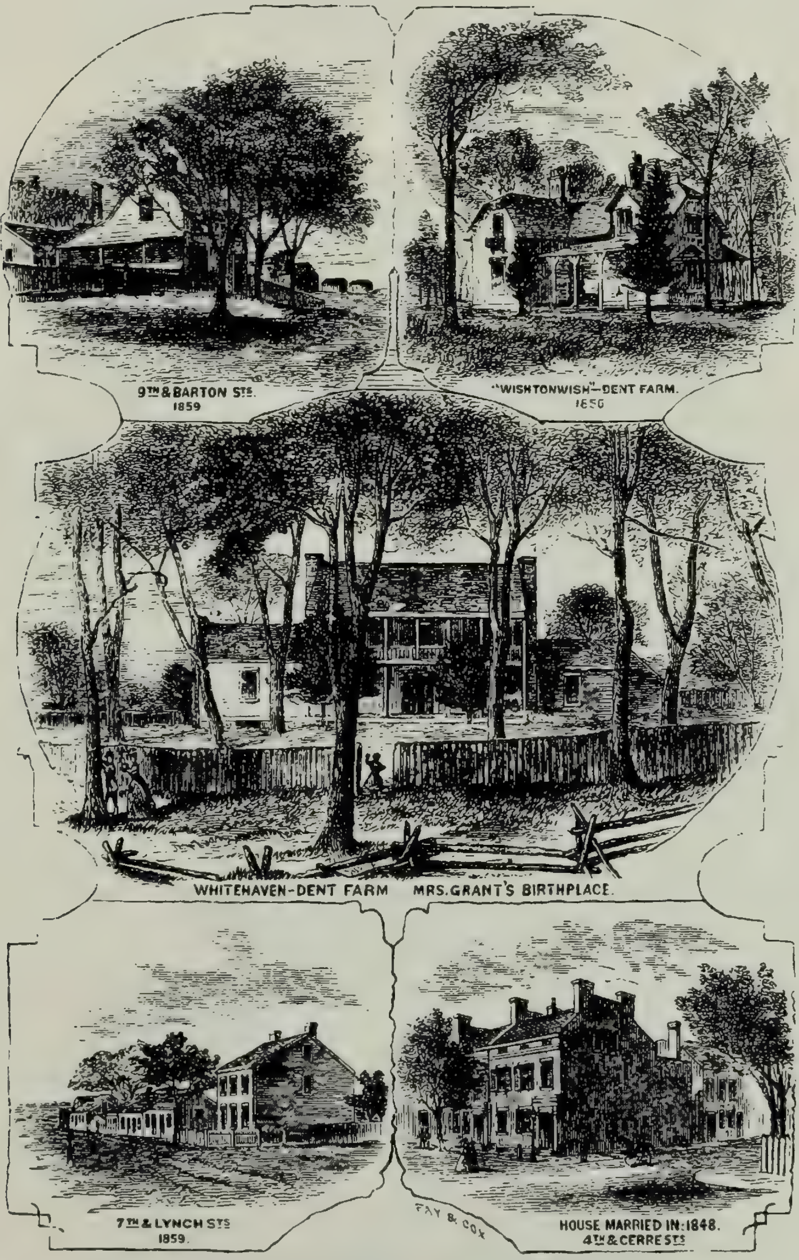


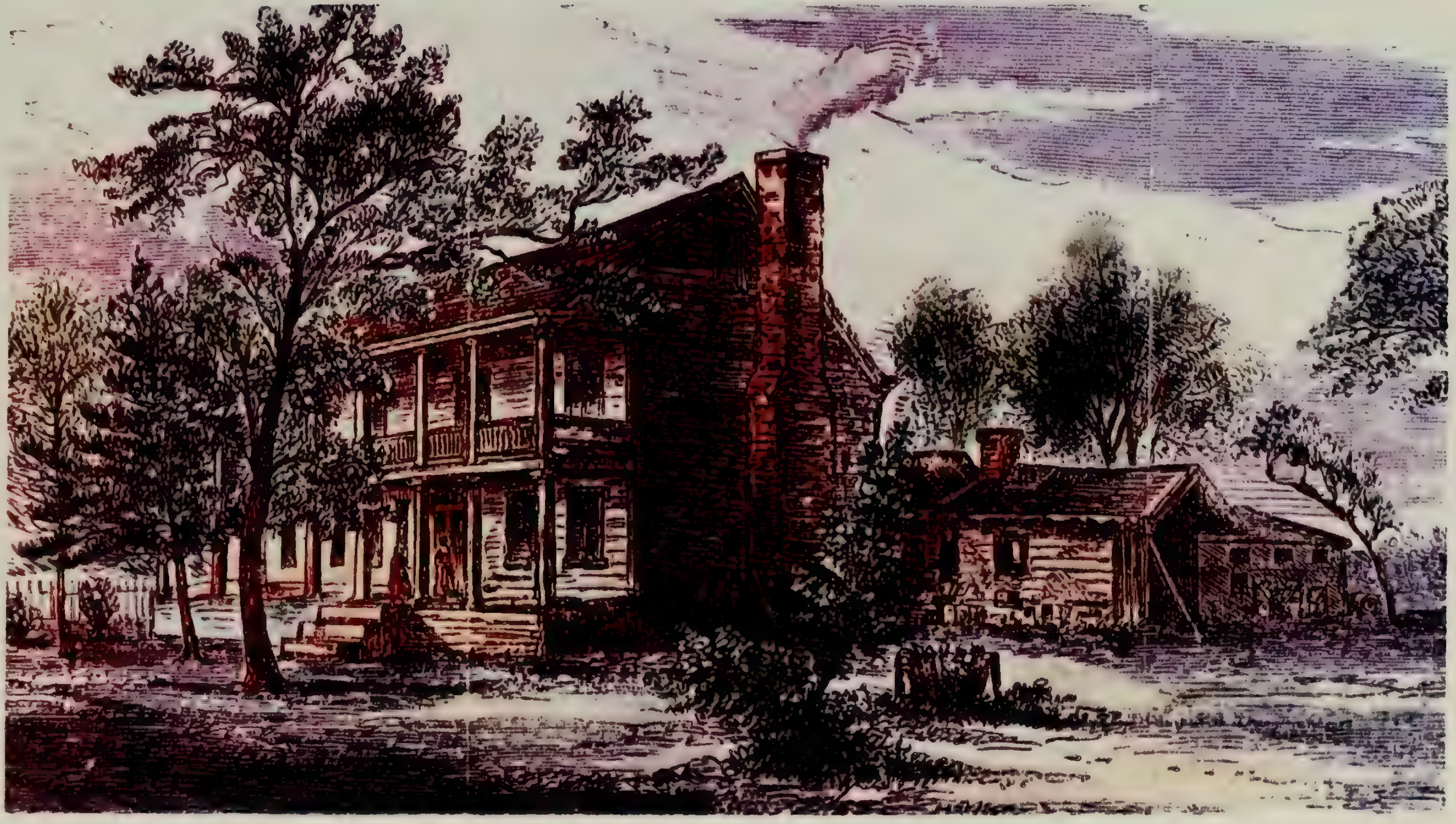
Figure 2.3 - The Main House viewed from the southwest, circa 1860. The earliest known photograph of the site. Note that the first floor kitchen at the northwest corner of the house had not yet been constructed when this photo was taken. At that time the second roof over the West Wing was supported by simple square posts; there was no raised porch deck beneath the roof. In the foreground are the driveway and board fence. (Actual size reprint of circa 1870 albumen print of circa 1860 photographic plate or print, ULSG collections).


9TH & BARTON STS.
1859
"WISHTONWISH"—DENT FARM.
1856
WHITEHAVEN-DENT FARM MRS. GRANT'S BIRTHPLACE.
7TH & LYNCH STS
1859.
FAY & COX
HOUSE MARRIED IN:1848.
4TH & CERRE STS

CAPT. GRANT'S RESIDENCE IN AND ABOUT ST. LOUIS.

Figure 2.4 - "Whitehaven-Dent Farm-Mrs. Grant's Birthplace." By the time this engraving was published, the East Wing had been added to the Main House (shown in the center engraving). (Albert D. Richardson, *A Personal History of U.S. Grant*, (Hartford, Connecticut: American Publishing Company, 1869), plate between pages 150 and 151, ULSG collections).

Figure 2.5 - "Near St. Louis." View of the Main House from the southeast showing the East Wing and Stone Building in the background (facing plate). This sketch has numerous errors attributed to "artistic license. It is unknown if the beige color in this illustration is representative of the color applied to the house at the time the illustration was produced, or if the color was also only in the mind of the artist. (Unbound colored engraving from *Every Saturday*, circa 1872, Jesse Francis collection. The illustration title may have been cropped).



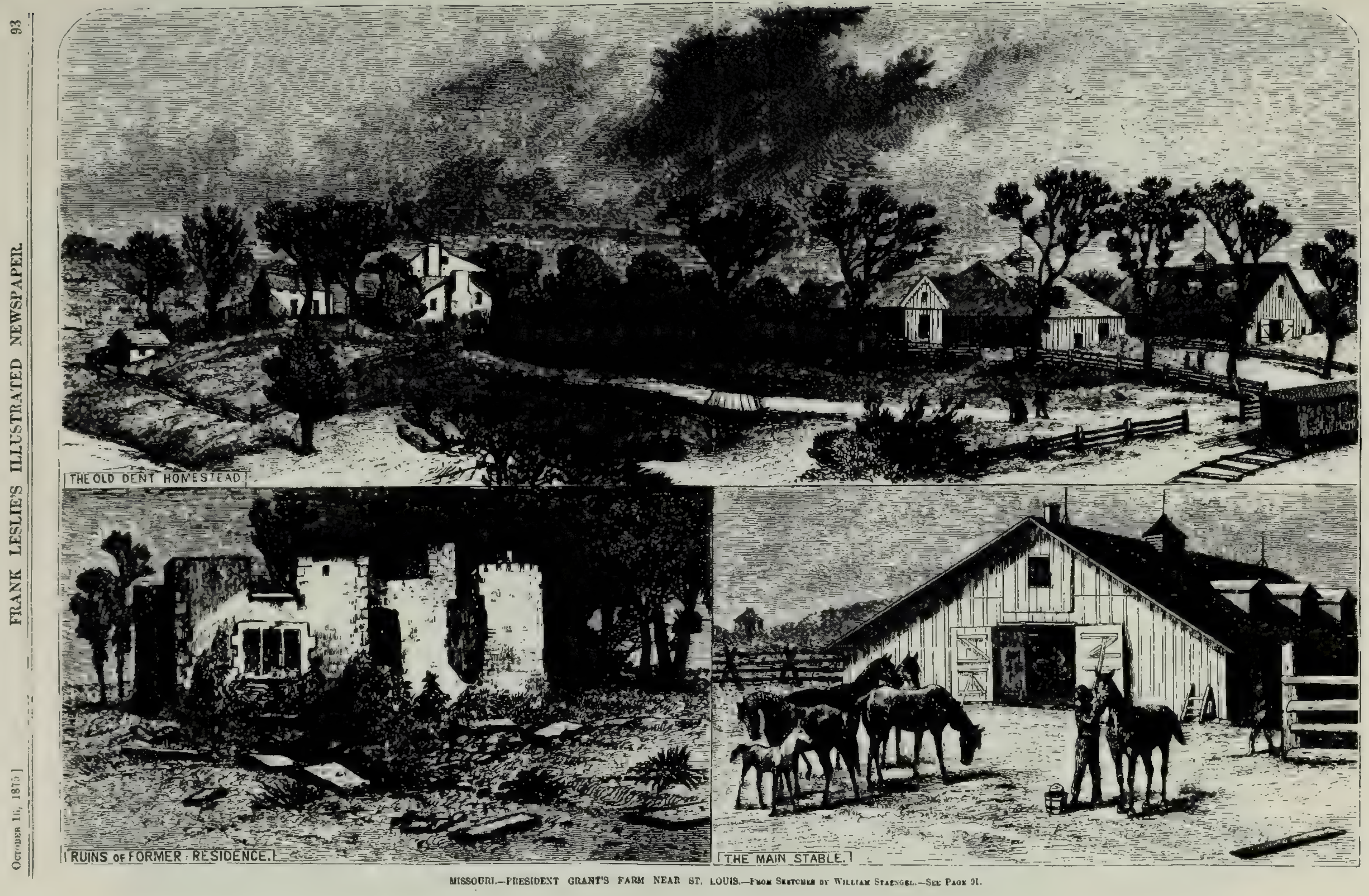

FRANK LESLIE'S ILLUSTRATED NEWSPAPER.
93
October 16, 1875.]
THE OLD DENT HOMESTEAD.
RUINS OF FORMER RESIDENCE.
THE MAIN STABLE.
MISSOURI.—PRESIDENT GRANT'S FARM NEAR ST. LOUIS.—From Sketches by William Staengel.—See Page 91.

Figure 2.6 - "Missouri-President Grant's Farm Near St. Louis." The top illustration shows the Main House and outbuildings in the core area of what is now Ulysses S. Grant National Historic Site. At lower left is an image of the remains of Wish-ton-wish, a home on the property in which the Grants resided while visiting St. Louis during the 1860s and 1870s. The Grant-ordered barn is seen in the detail drawing at lower right. (Engraving from a sketch by William Staengel, *Frank Leslie's Illustrated Newspaper*, (October 16, 1875), 93, ULSG collections).

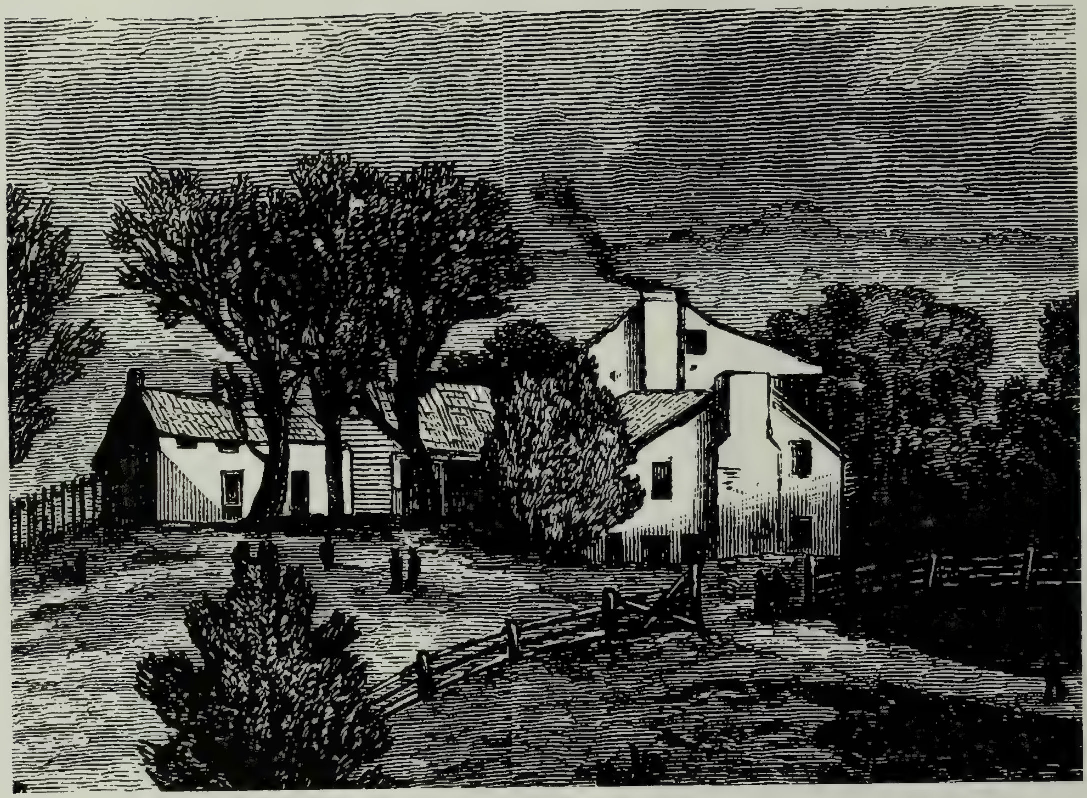


Figure 2.7 - "Missouri-President Grant's Farm Near St. Louis." View of the Main House from the northwest, also showing the west elevation of the Stone Building. By the time this view was published, the first floor room at the northwest corner of the house had been added. (Enlarged detail of engraving from a sketch by William Staengel, *Frank Leslie's Illustrated Newspaper*, (October 16, 1875), 93, ULSG collections).

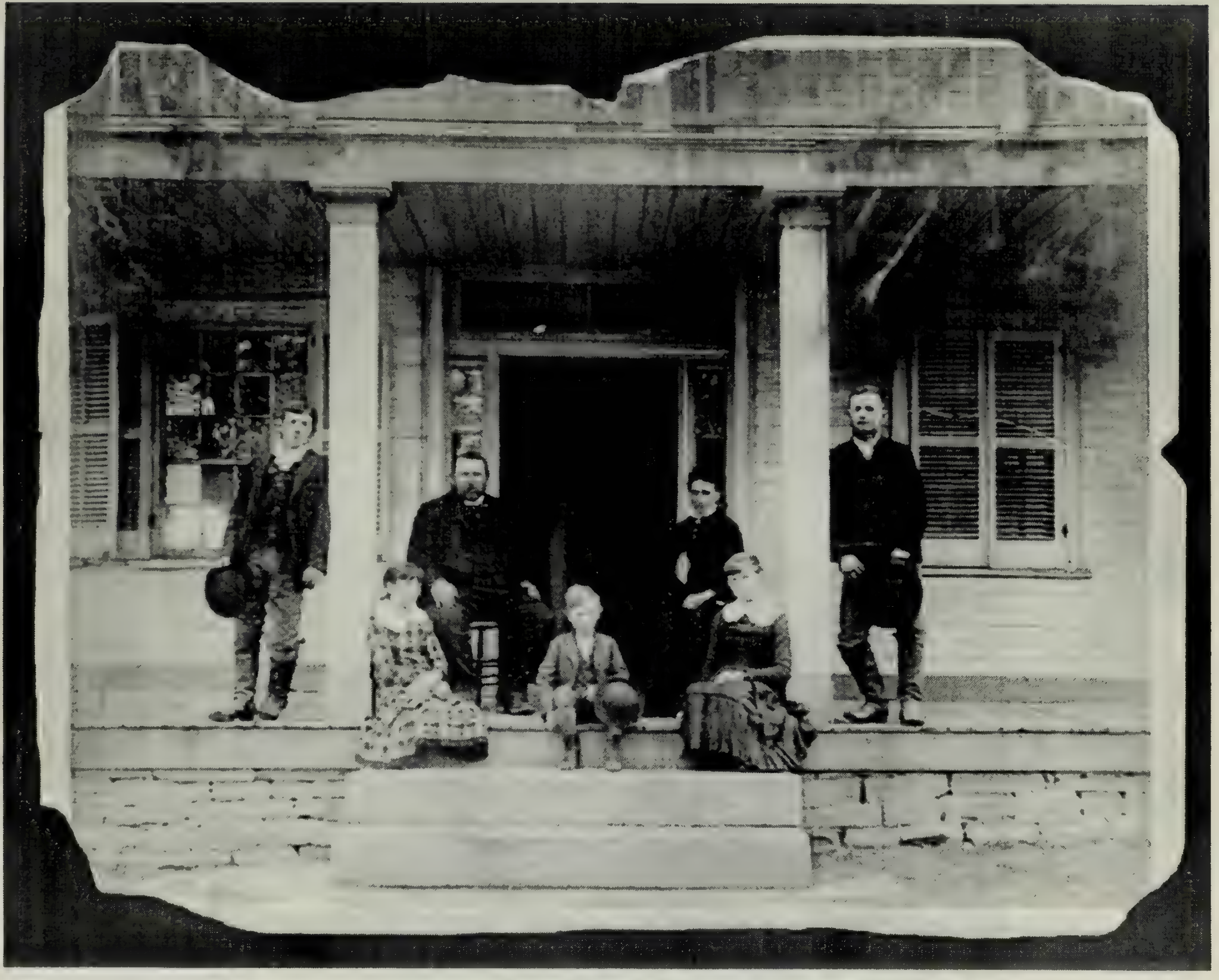


Figure 2.8 - The Leis family on the first floor front porch of the Main House, circa 1883. Henry C. Leis (seated in chair) leased White Haven and resided in the Main House from about 1877 until 1895. Note the stone porch foundation. (Albumen print from Ellen Monaghan collection).

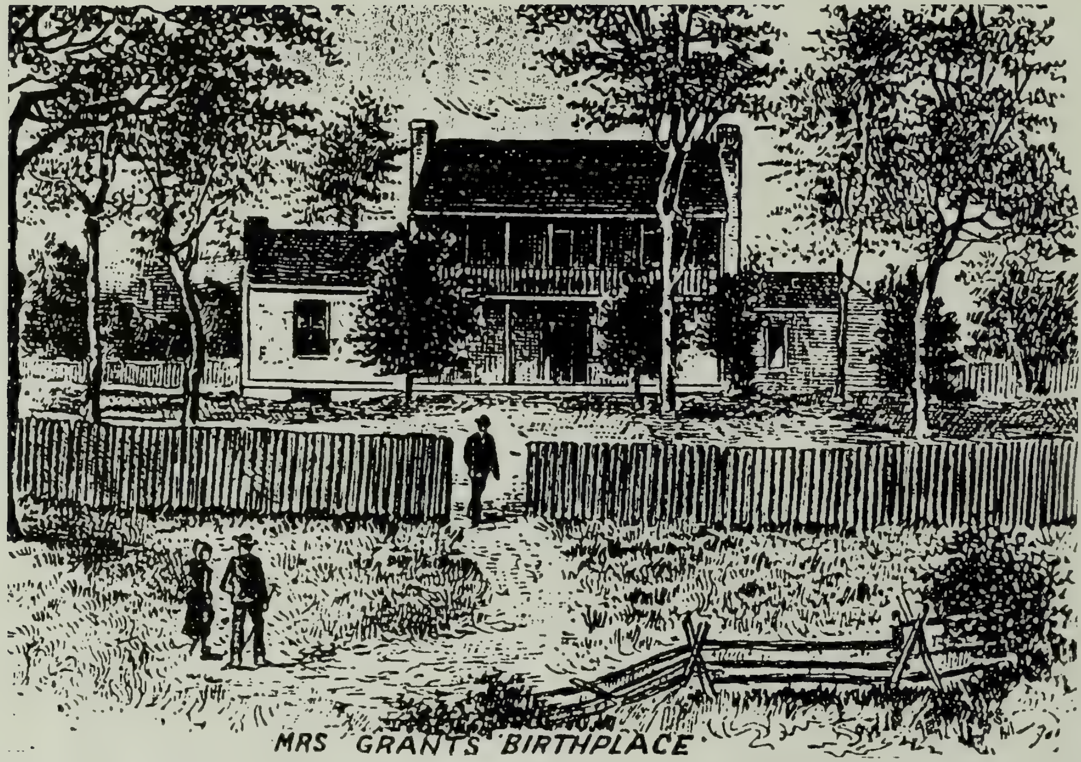


Figure 2.9 - "Residence of Captain and Mrs. Grant in and about St. Louis: Mrs. Grant's Birthplace." This illustration seems to be a copy of the illustration seen in Figure 2.4 with some modifications. (Engraving from Herman Dieck, *Life and Public Service of Ulysses S. Grant*, 1885, Missouri Historical Society).

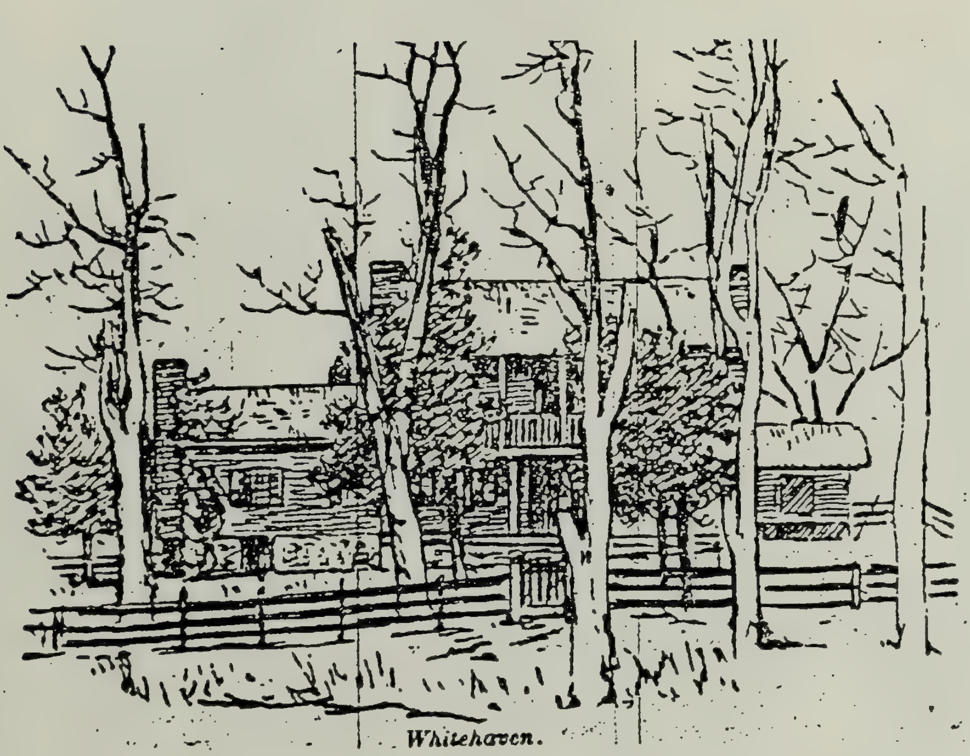


Figure 2.10 - "Whitehaven." (Engraving from "St. Louis Republican," 24 July, 1885, Missouri Historical Society).

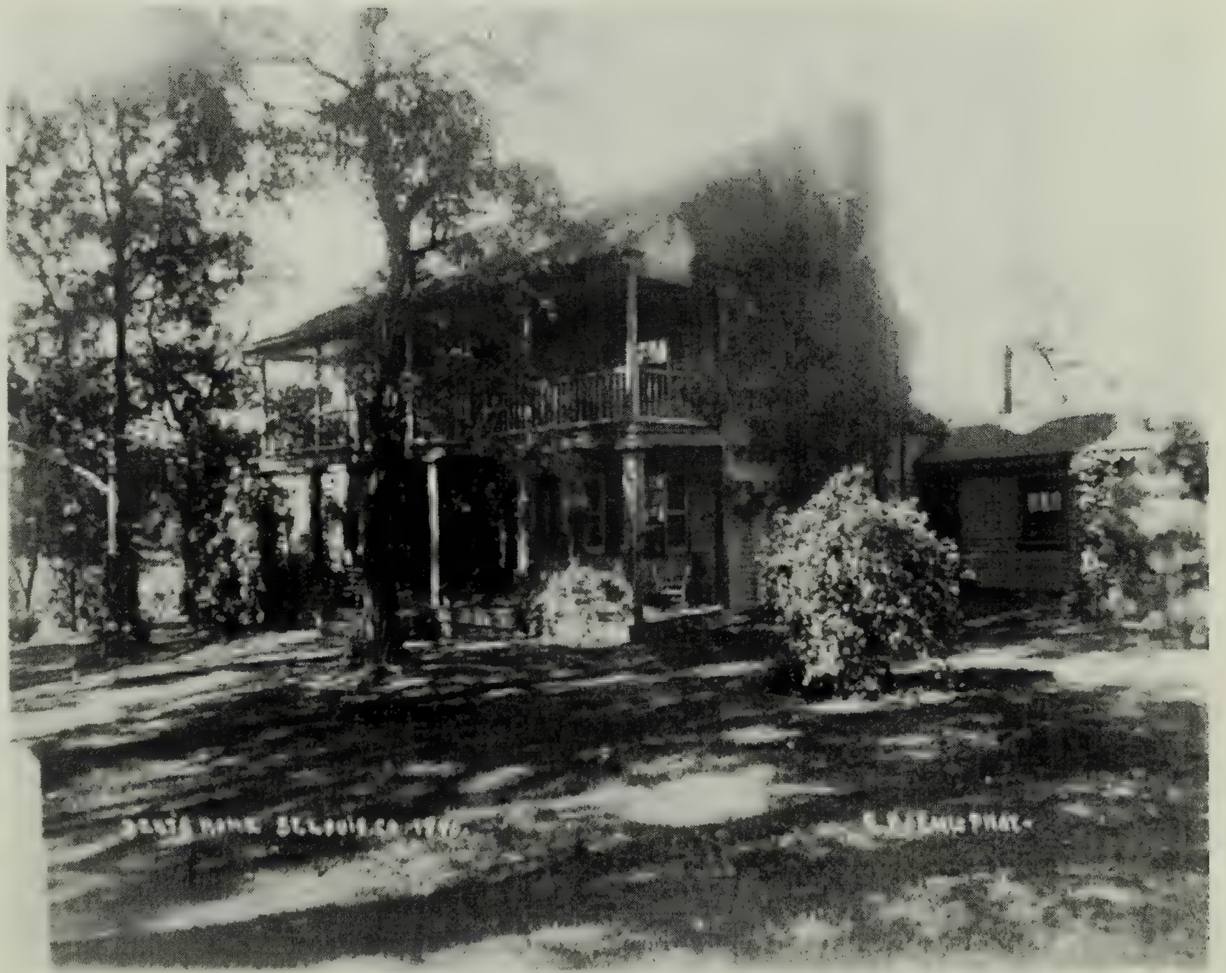


Figure 2.11 - "Dent's Home St. Louis Co. 1890." View of the Main House from the southwest. Note the clear image of the Hunt Addition brick chimney in the background. (Photograph by Emil Boehl, printed by permission of Missouri Historical Society).

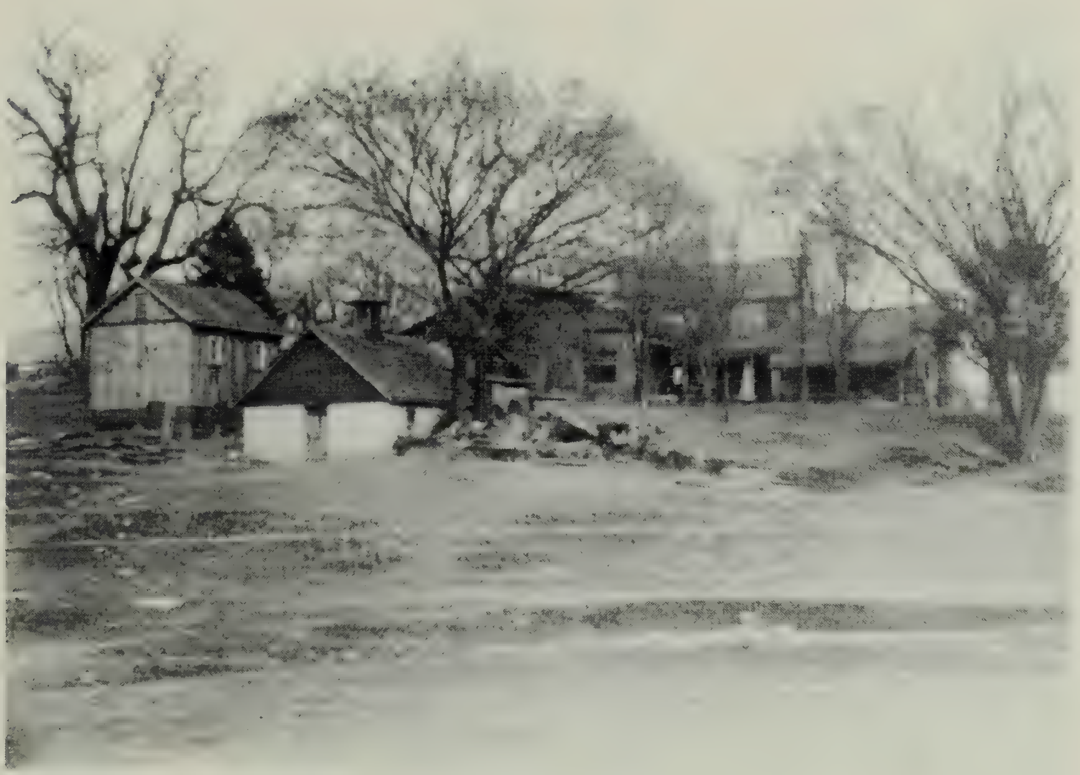


Figure 2.12 - View of the Main House and outbuildings from the north, 1913. This photograph was taken about the time Albert Wenzlick purchased the property. The Prairie Spring is in the foreground, and the Ice House and Chicken House in the middle ground. (Print from Bill Wenzlick collection).

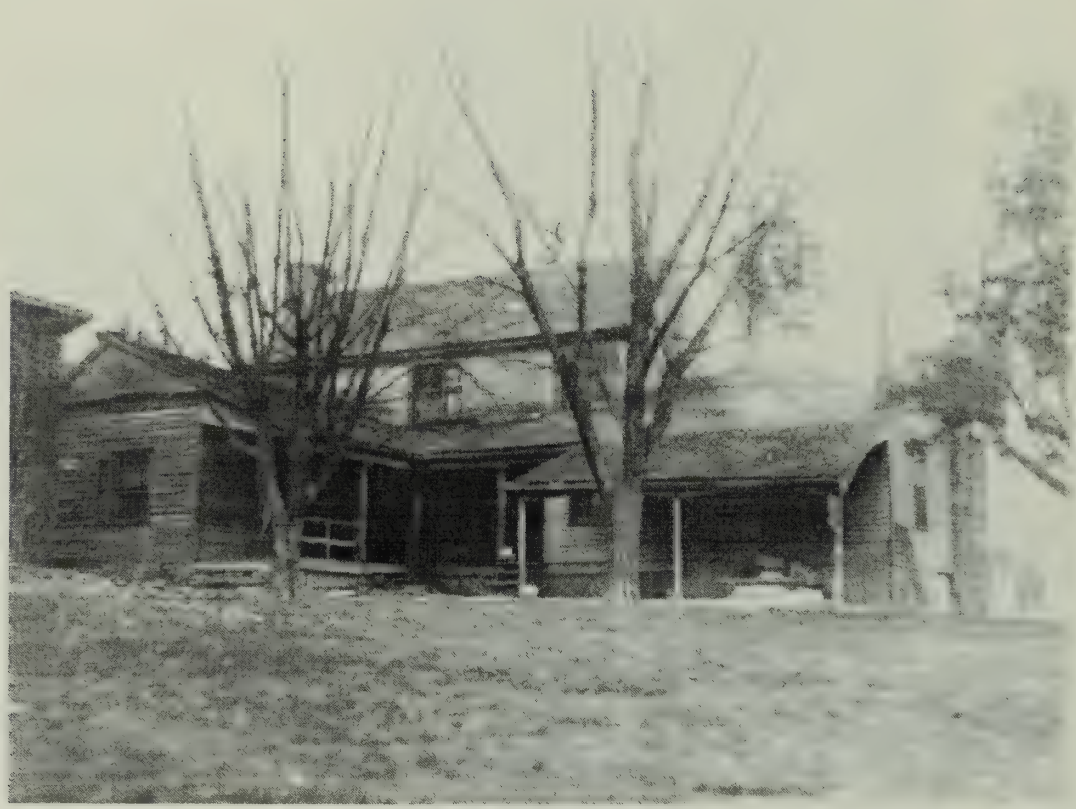


Figure 2.13 - View of the Main House from the northwest, 1913. This is yet the best photographic image of the the rear of the house as it appeared during early twentieth century. It is believed that the house had a similar appearance throughout much of the late nineteenth century. Note the image of the wooden canopy roof extending from the north elevation of the first floor kitchen, and the cistern immediately in front of the canopy roof. (Print from Bill Wenzlick collection).

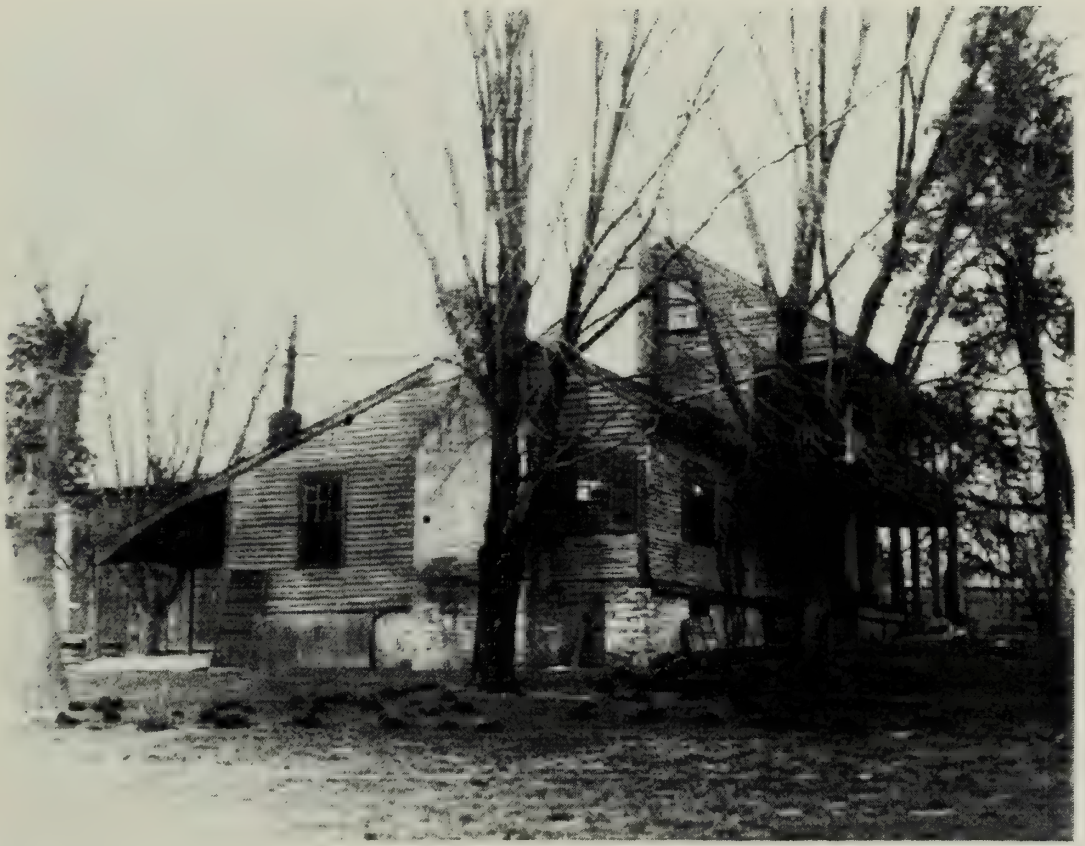


Figure 2.14 - View of the Main House from the southwest, 1913. Note the short cellar door at the southwest corner of the structure, just to the right of the west chimney stack. (Print from Bill Wenzlick collection).

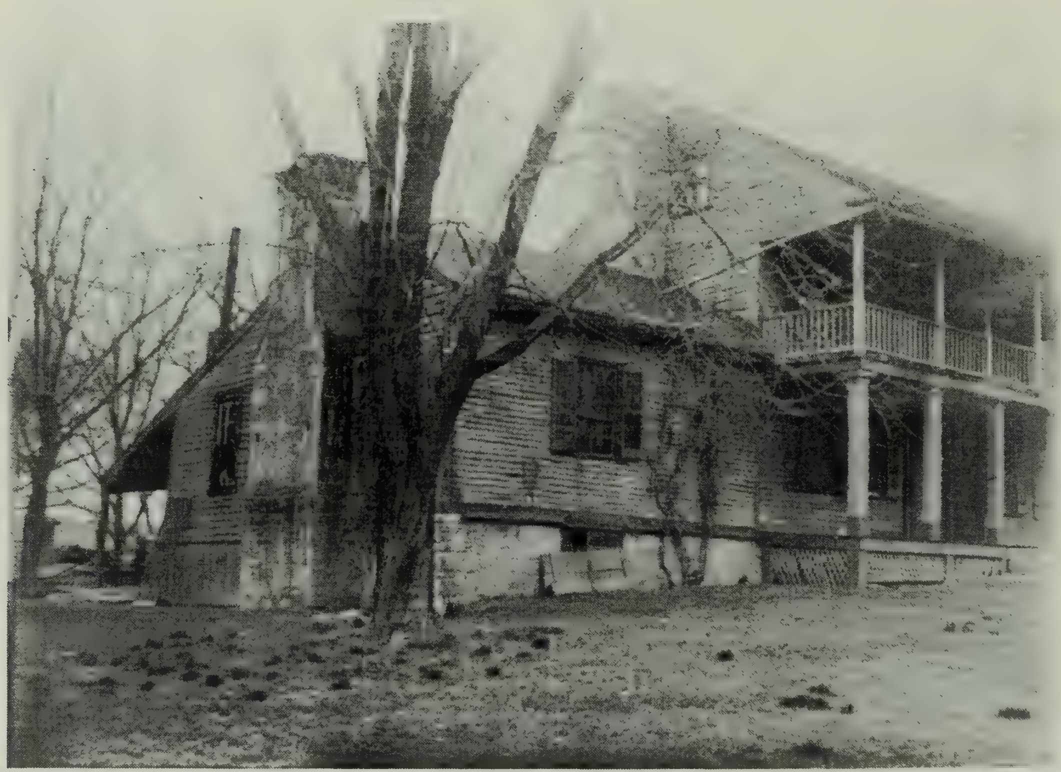


Figure 2.15 - "1913." View of the Main House from the southwest, 1913. (Print from Bill Wenzlick collection).

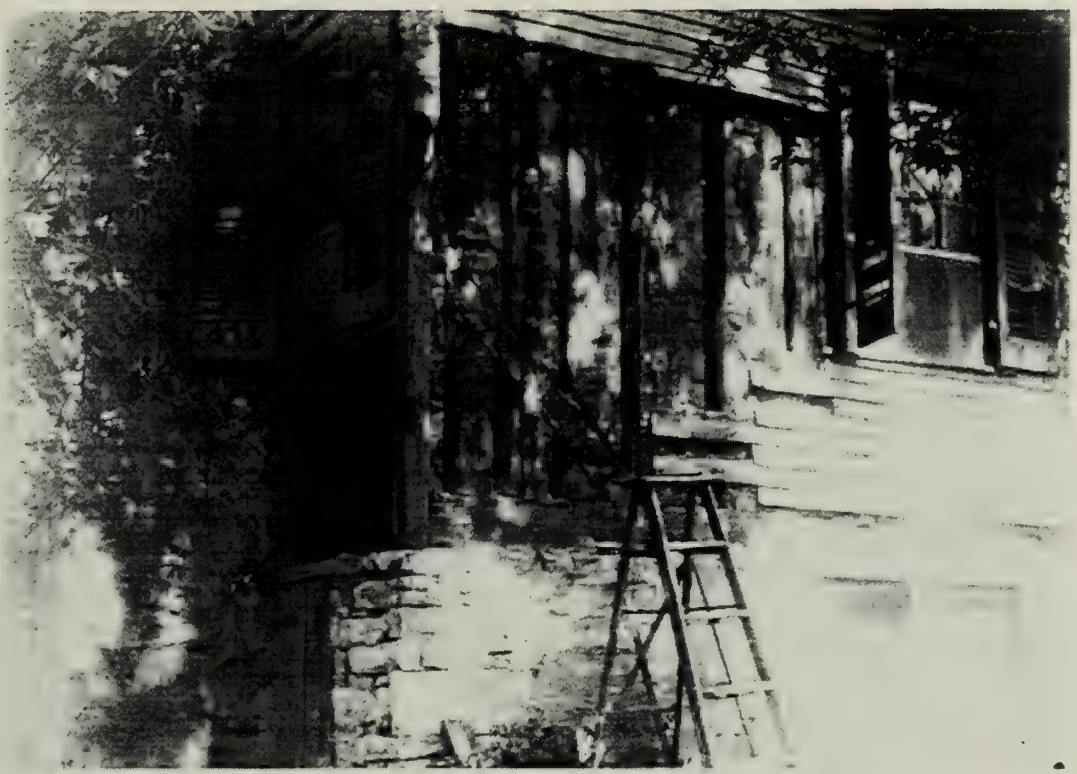


Figure 2.16 - View of the West Wing of the Main House at the southwest corner, circa 1915. This image shows the vertical log construction of the West Wing during Albert Wenzlick repair work. Note the diagonal brace extending from the foundation to the corner of the West Wing. (Original print from Bill Wenzlick collection. See also copy of this print in HABS collection, 112179-HABS MO., 95AFT, v. 1-4, 1940).

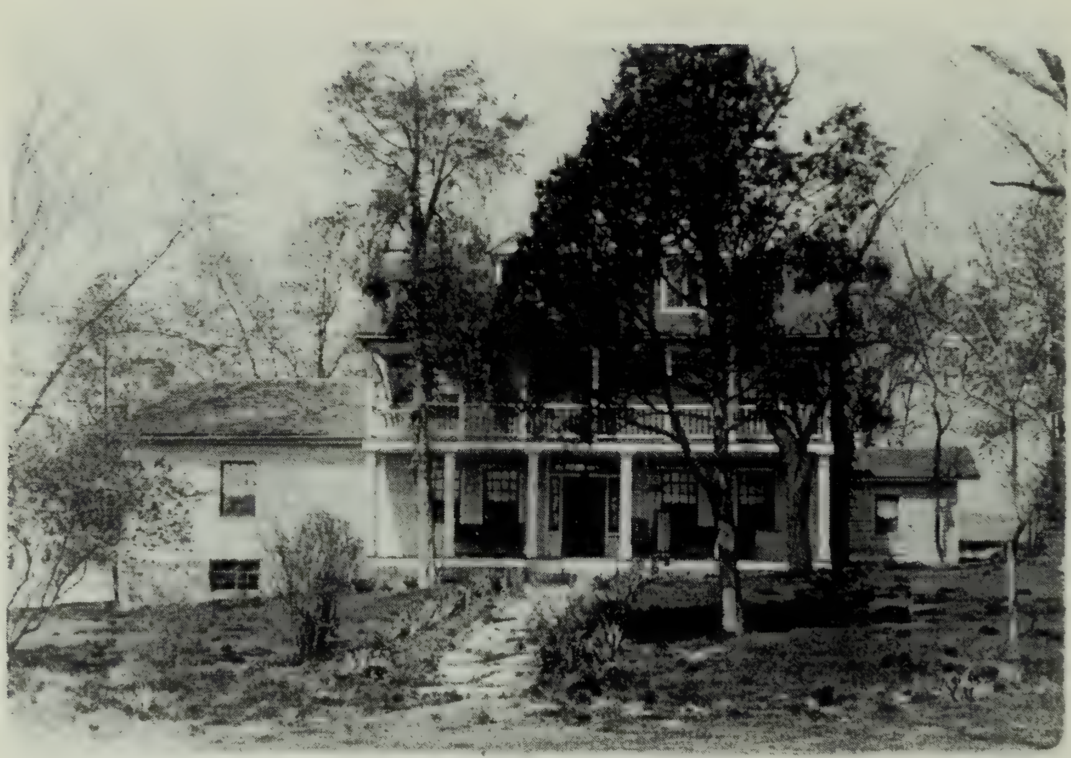


Figure 2.17 - View of the Main House from the south, circa 1916. By the time this photograph was taken, dormers were added to the roof. Note the image of a barn roof just to the right of the East Wing. (Print from Bill Wenzlick collection).

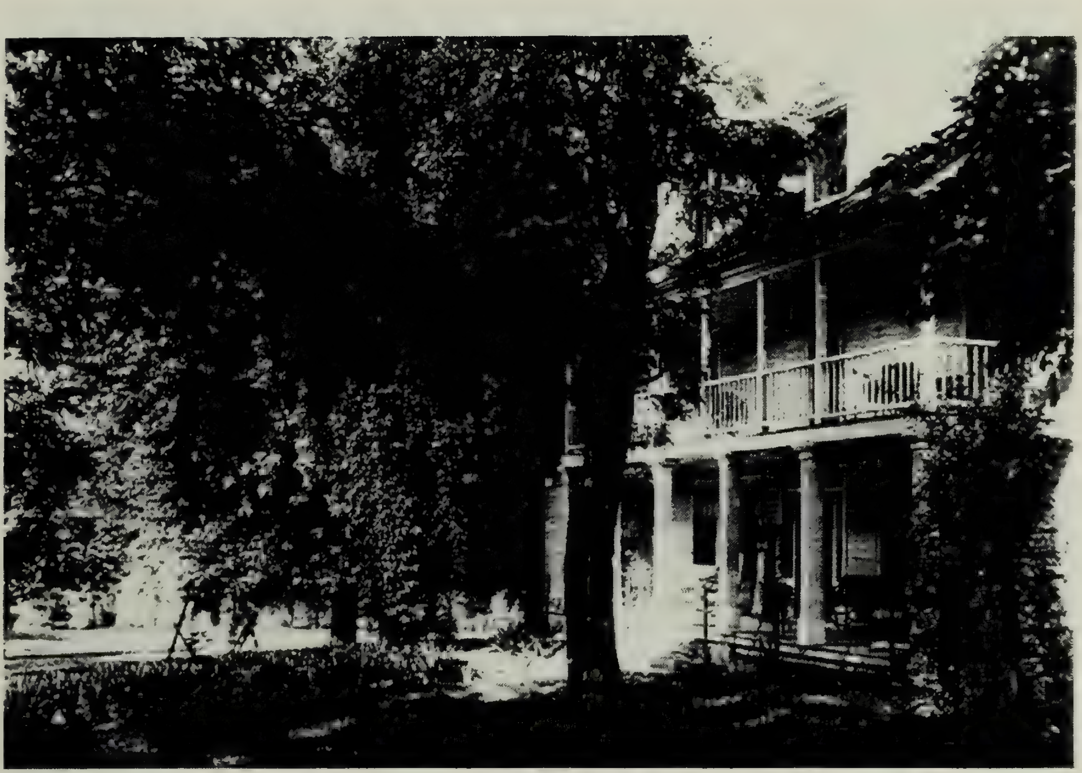


Figure 2.18 - View of the Main House from the southwest, circa 1916. (Print from Bill Wenzlick colllection).

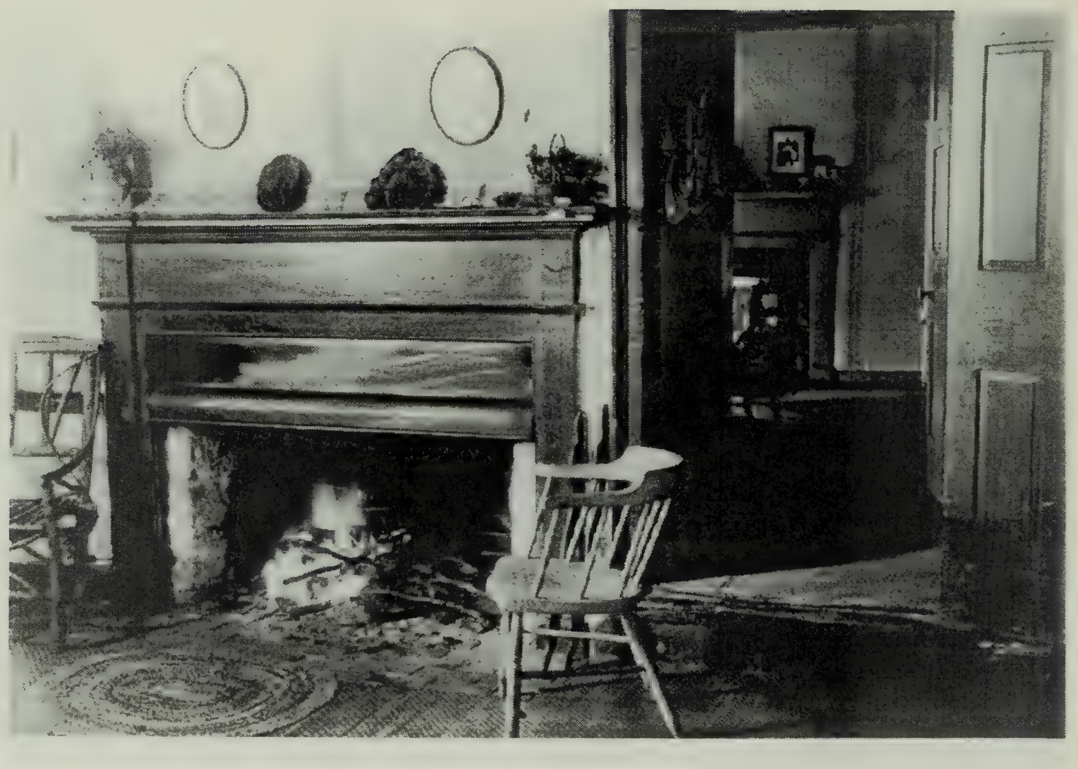


Figure 2.19 - Interior view of Room 103 toward the west wall, 1916. Fireplaces in Rooms 103 and 104 can be seen. (Print from Bill Wenzlick collection. See also "Scene of Gen. Grant's Courtship - A Hidden Spot of Interest," *Historic Houses of Missouri* (December 8, 1916), 35, Vol. 1, excerpt of bound scrapbook, Missouri Historical Society).

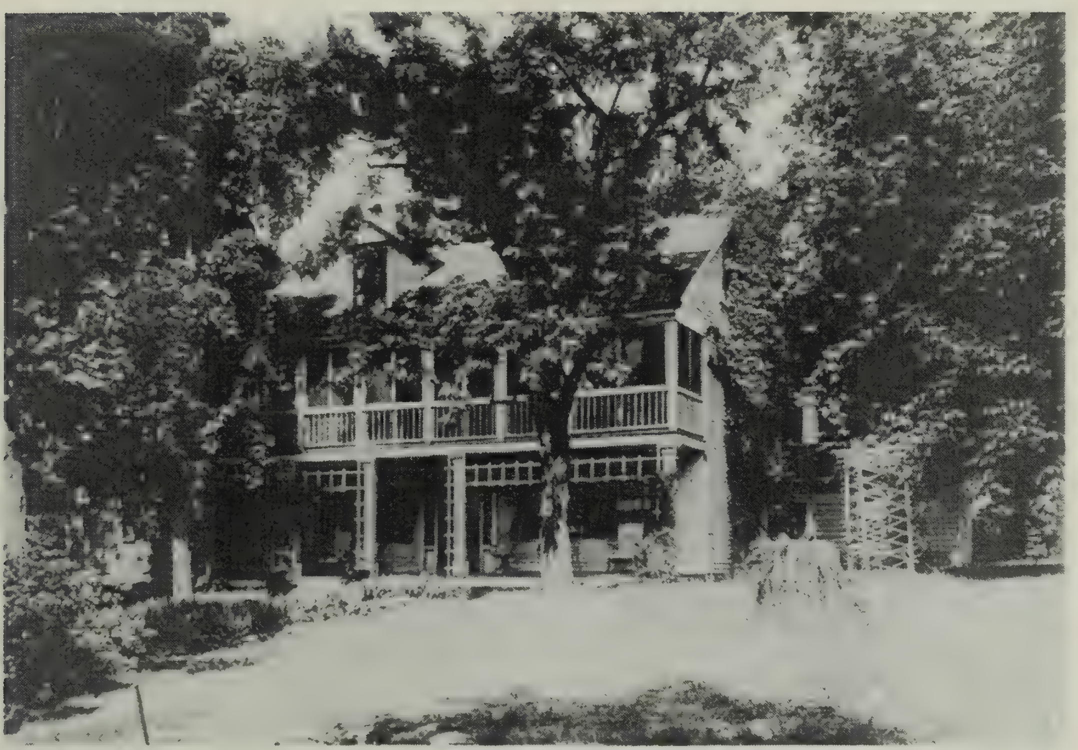


Figure 2.20 - View of the Main House from the south, 1928. Note the trellis at the first floor porch, and the screen windows at the second floor porch. (Print from Bill Wenzlick collection. Also in "The House in which Gen. Grant Courted and Lived is Still A Staunch Structure," *St. Louis Globe-Democrat Magazine* (November 4, 1928), 4).

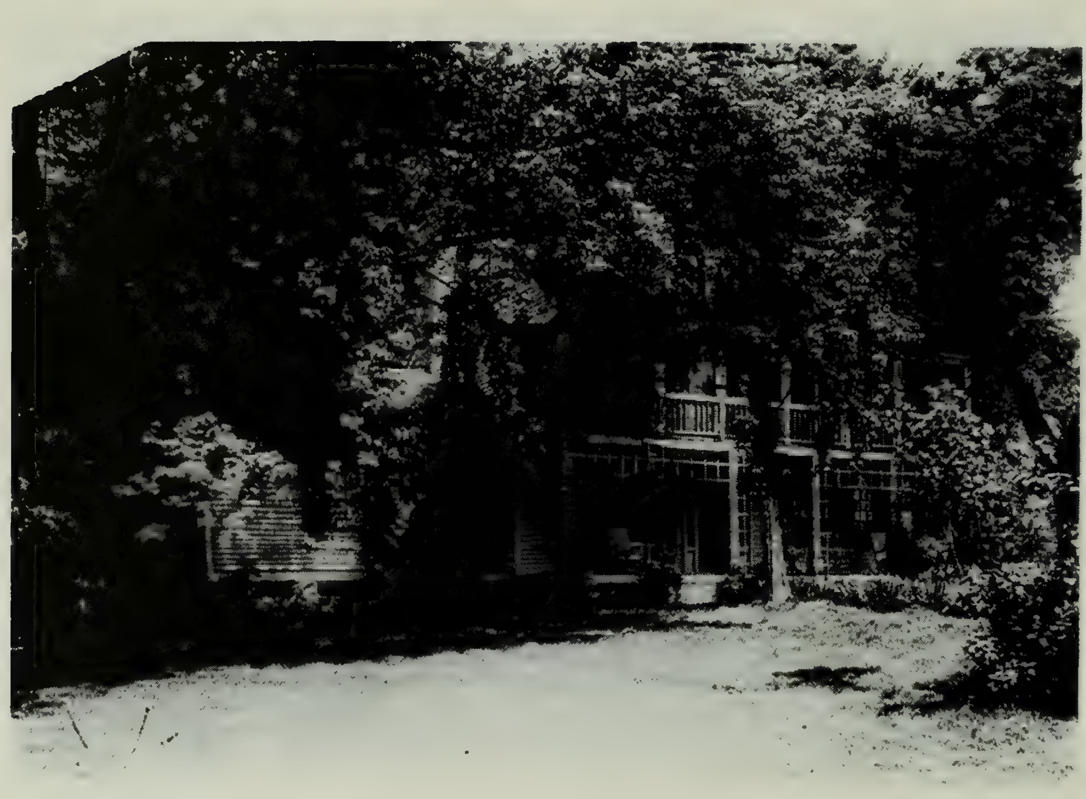


Figure 2.21 - View of the Main House from the southwest, 1928. (Print from Bill Wenzlick collection).

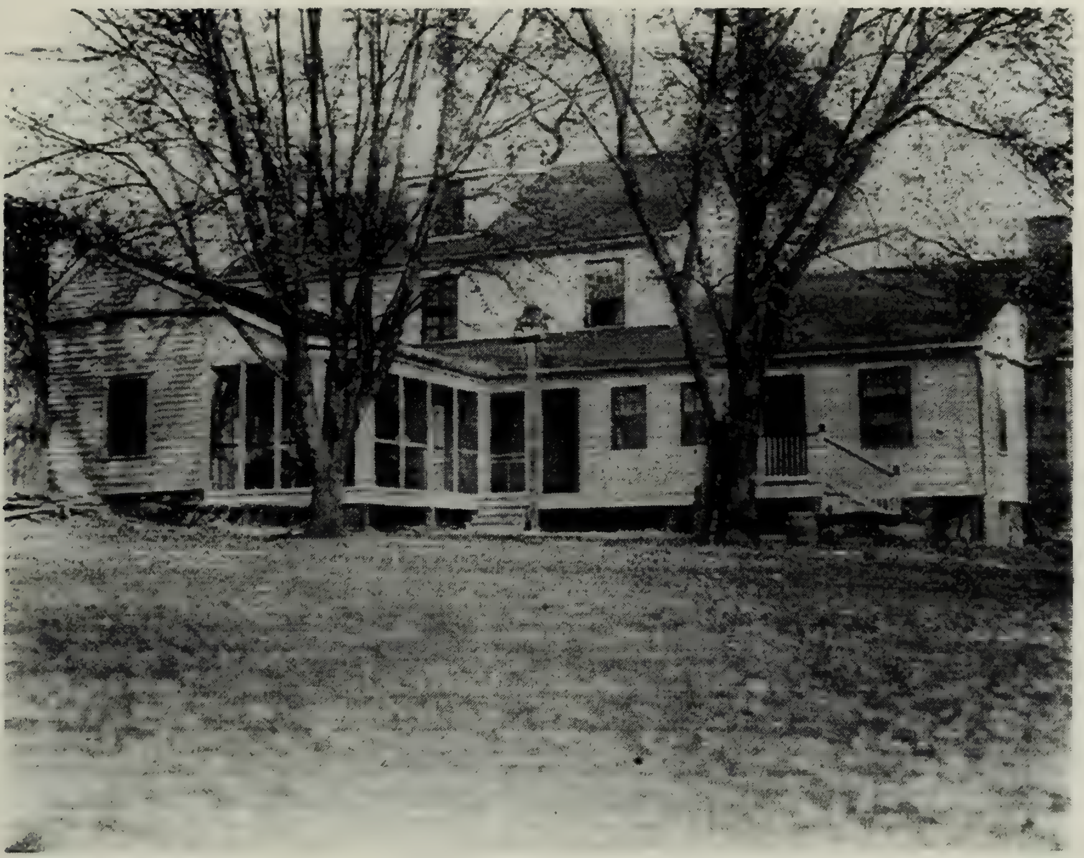


Figure 2.22 - View of the Main House from the northwest, circa 1938. (Print from Bill Wenzlick collection).

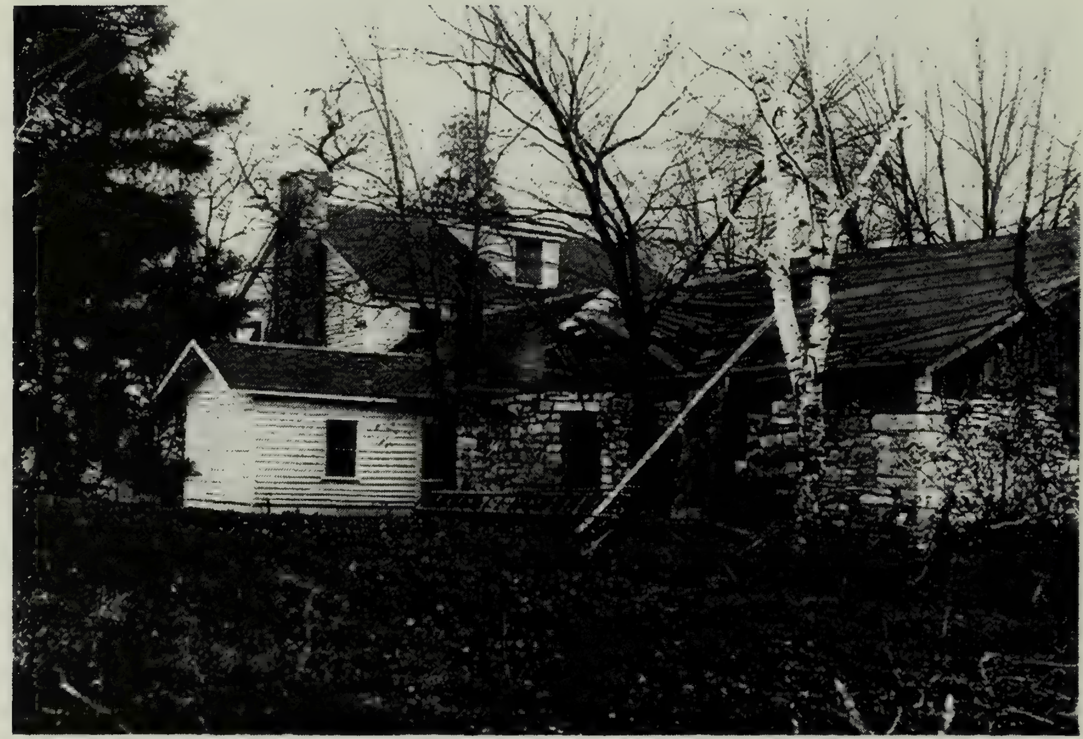


Figure 2.23 - View of the Main House and Stone Building from the northeast, circa 1938. Note that a portion of the Stone Building roof is colapsed in this image. (Print from Bill Wenzlick collection).

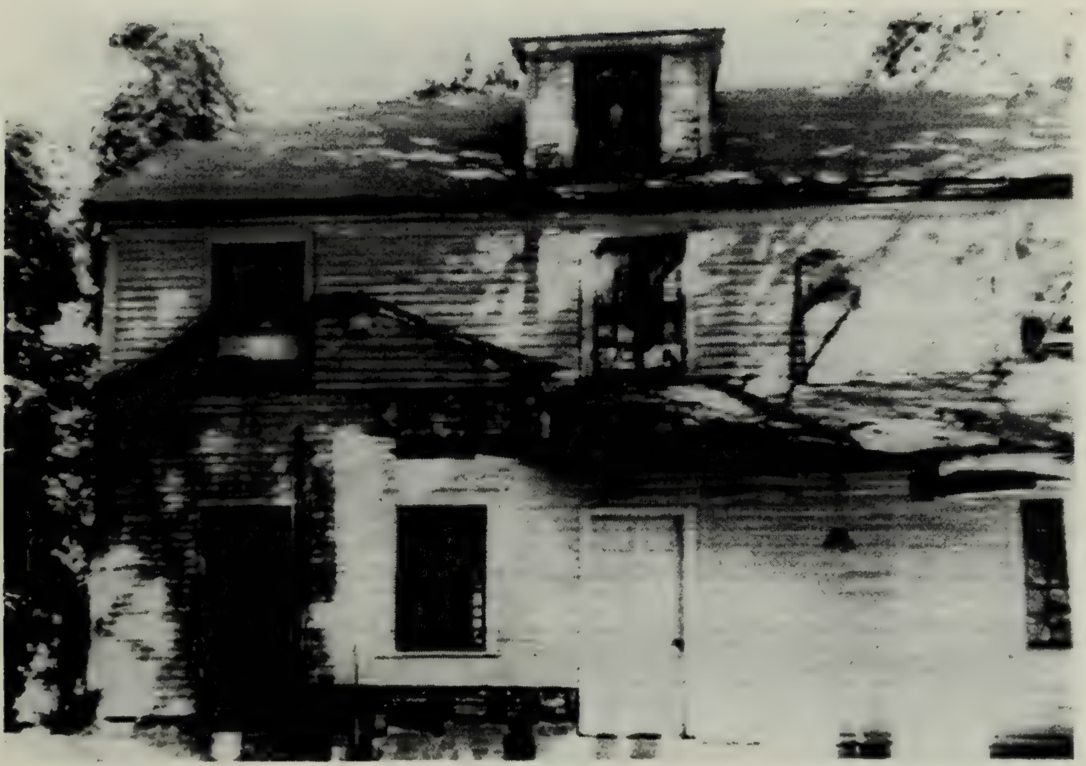


Figure 2.38 - View of the Main House from the north after demolition of the Hunt Addition and East Wing, 1940. Note the ghost line of the removed Hunt Addition gable roof against the second floor siding. (Print from Bill Wenzlick collection).

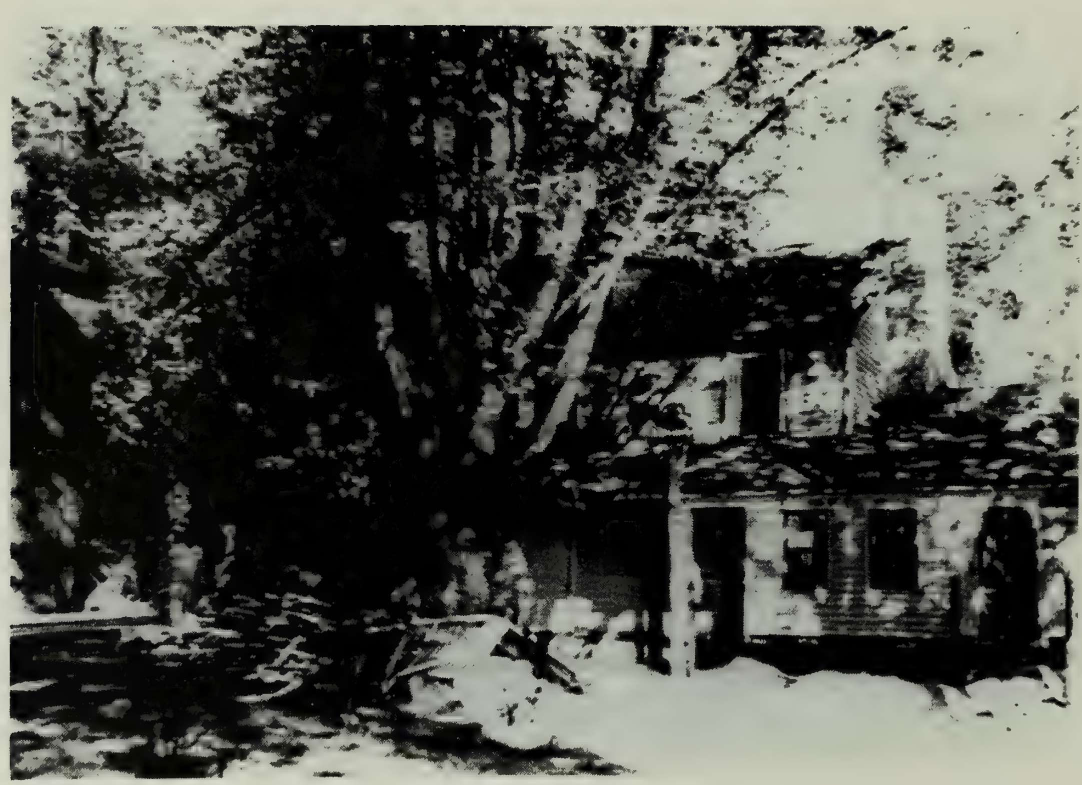


Figure 2.39 - View of the Main House from the north after demolition of the Hunt Addition and East Wing, 1940. (Print from Bill Wenzlick collection).

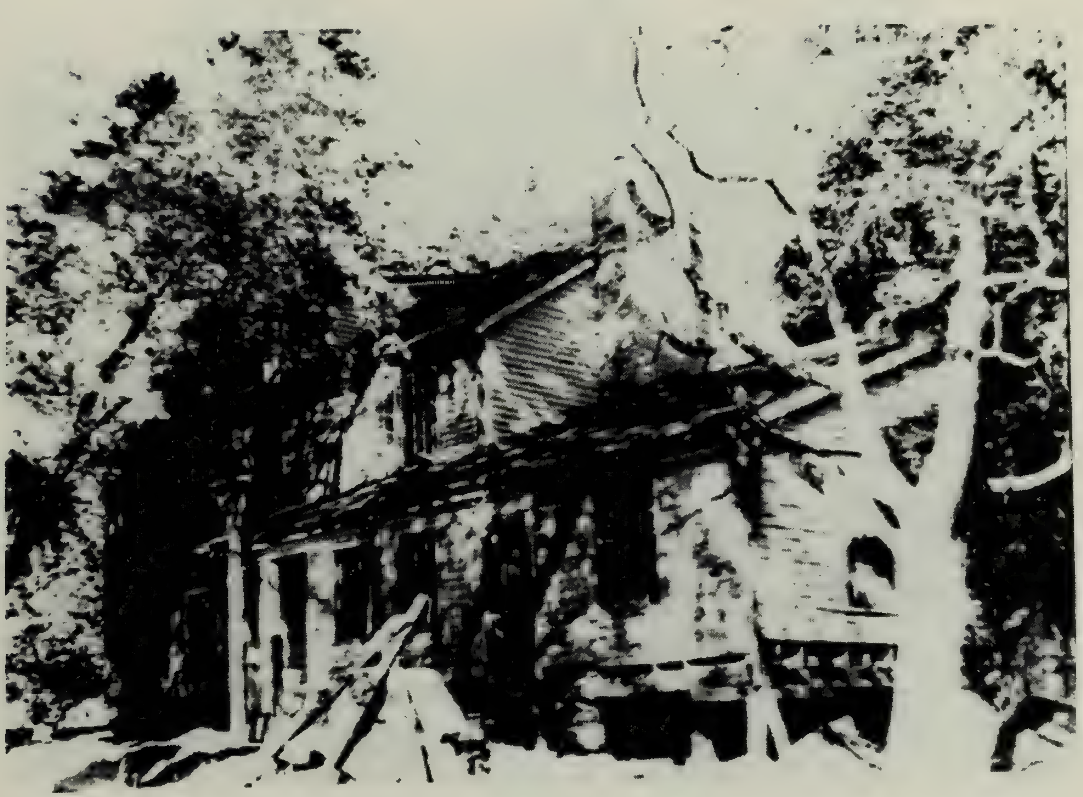


Figure 2.40 - View of the Main House from the northwest after demolition of the Hunt Addition and East Wing, 1940. Note that the foundation in this image is being excavated beneath Room 106 in preparation from construction of the basement apartment. (Print from Bill Wenzlick collection).

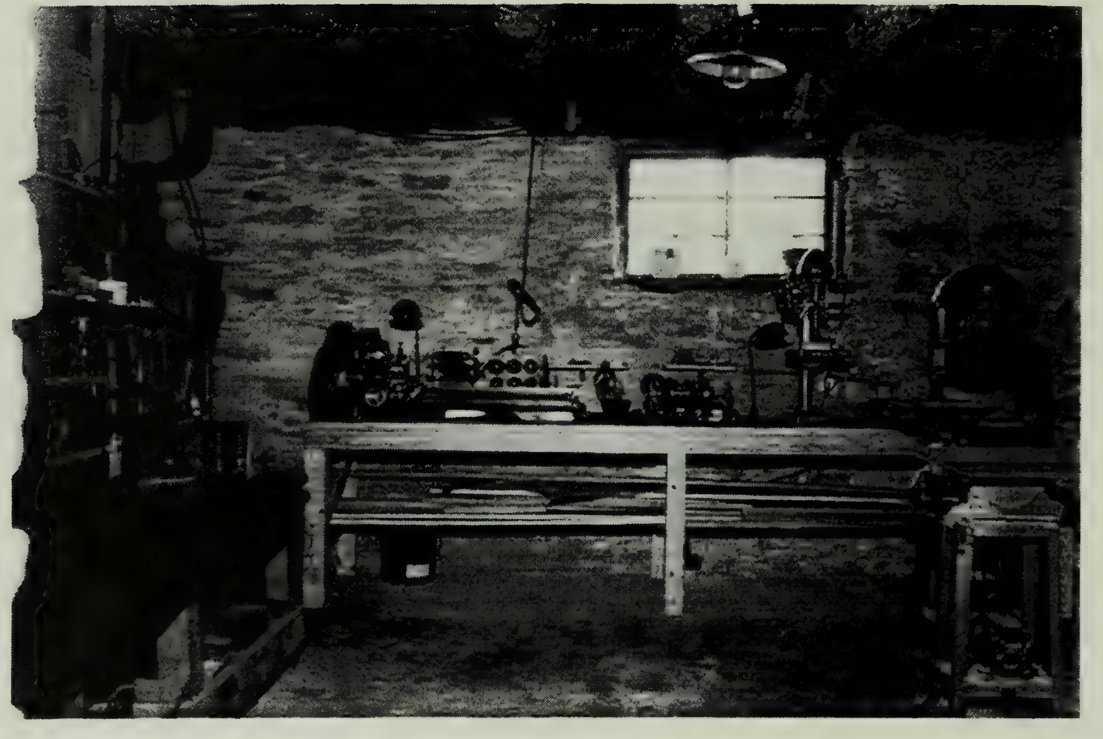


Figure 2.41 - View of the West Wing basement (Room 003) from the north during its use as a workshop, circa 1945. (Print from Bill Wenzlick collection).

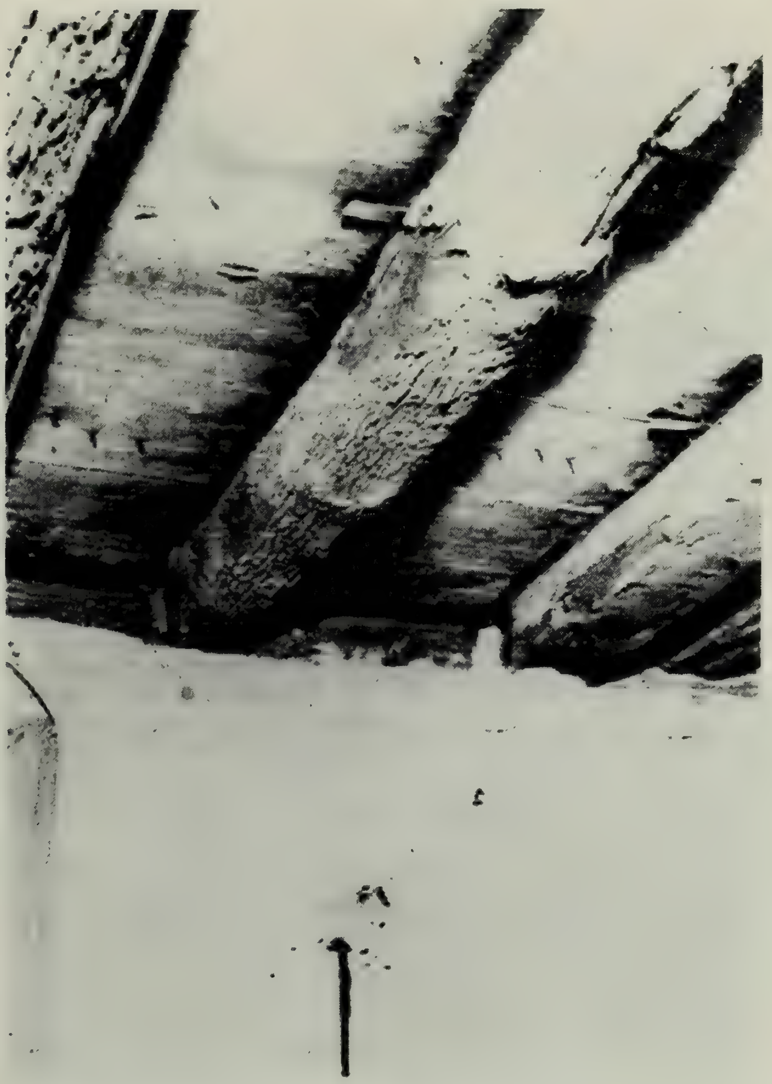


Figure 2.42 - View of the log joists at the ceiling at the north wall of West Wing basement Room 003, circa 1945. (Print from Bill Wenzlick collection).

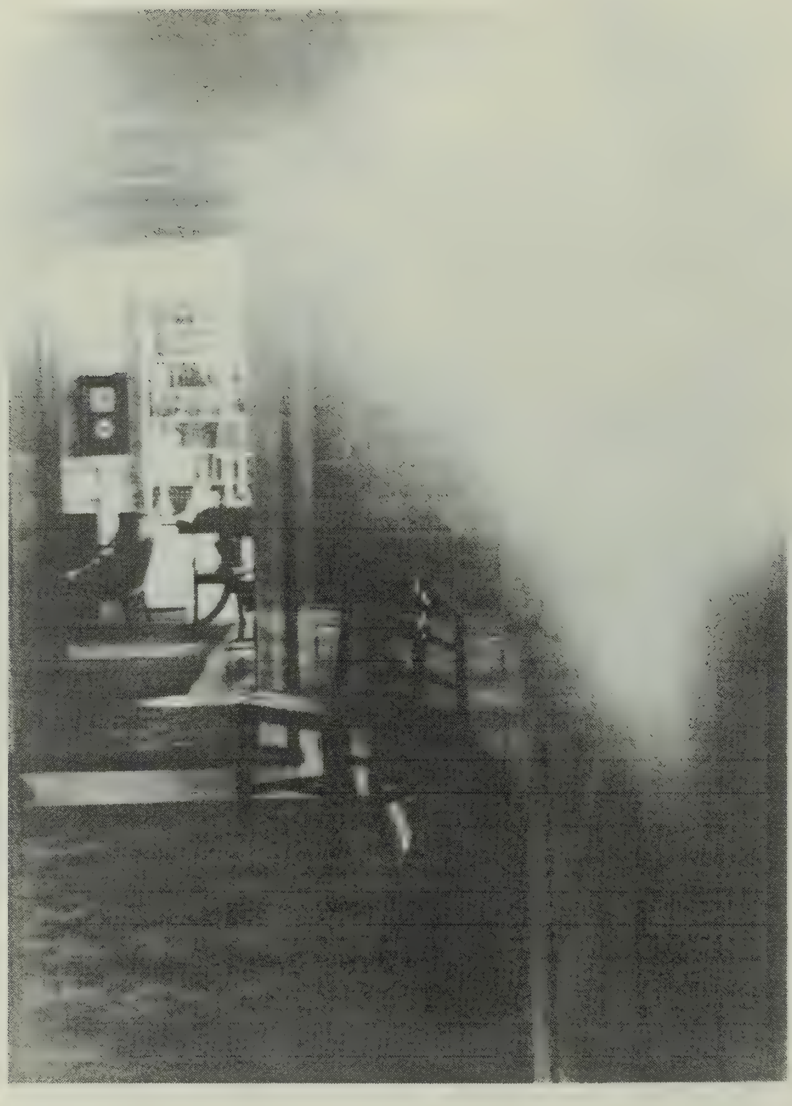


Figure 2.43 - View through Room 103 toward the West Wing Room 104, 1947. (Print from Bill Hayes collection).

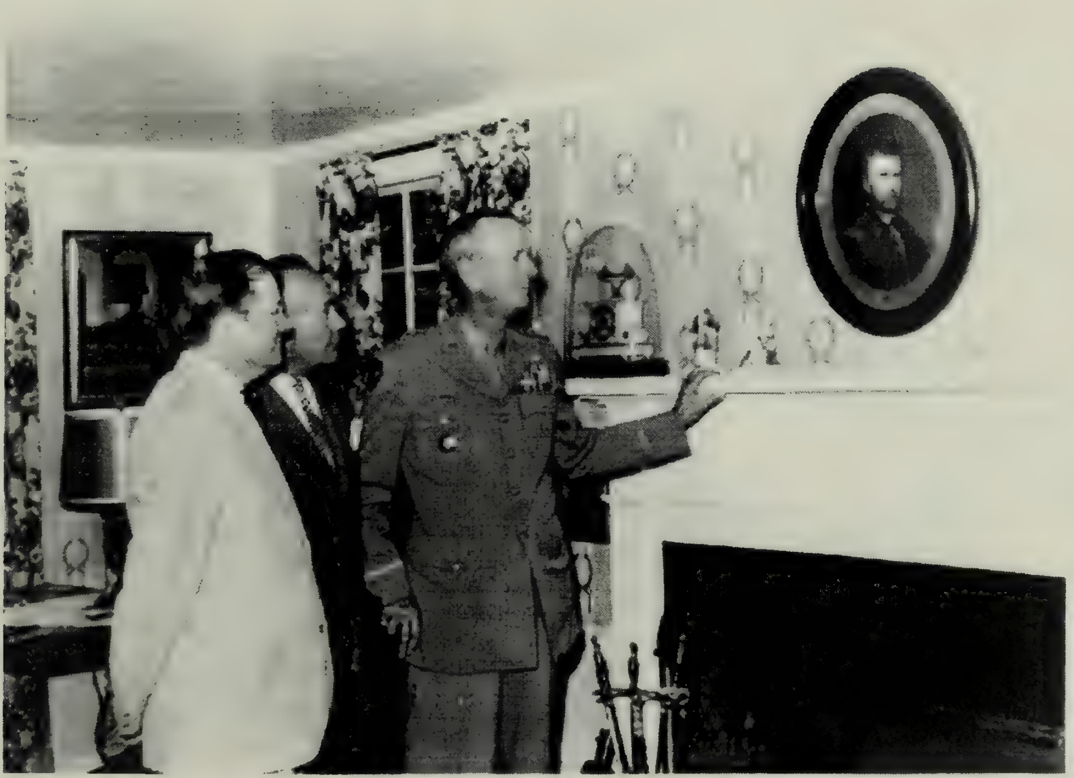


Figure 2.44 - "Gen. "Skinny" Wainright [*sic*] admiring another 4 star general, White Haven Living Room." Circa 1949 view of Room 101 towards the northeast showing the 1940 replacement chimney piece. General Johnathon Mayhew Wainwright (1883-1953) is shown at the right. The other individuals are unidentified. (Print from Bill Wenzlick collection).

HISTORICAL BACKGROUND AND CONTEXT

On September 3, 1796, an 800 arpent[4] tract of land within United States Survey No. 9 was conceded to one Hugh Graham.[5] This is the first account of the 9.415 acre[6] land parcel currently administered by the NPS as Ulysses S. Grant National Historic Site which lies within that survey at the northeast boundary line. Little is known about Graham, but he probably farmed a portion of his land along the Gravois Creek. It is unknown where he may have constructed his home nor any other structures, but cabins may have been constructed by squatters or tenants who resided on Graham's land.[7]

Almost exactly three years later, on September 6, 1799, Graham ceded and traded the land to James Mackay.[8] Mackay purchased improvement rights for cabins, fields, and crops but not the land from John Murphy on the same parcel in 1804.[9] Mackay was born in highlands of Scotland in 1759 and emigrated to the North American continent in 1776, quickly establishing himself in the fur trade. He eventually made his way from Canada to Missouri to take command of the St. Charles territory directly north of the Missouri River. Through payments in land by the Spanish government, Mackay eventually traded vast holdings along the Missouri River for land along the Gravois Creek including that owned by Graham. On February 24, 1800, Mackay married Isabelle Long, daughter of John Long, and settled on his Gravois Creek land.[10] It is unknown what, if any, improvements he may have made to the land.

Isabelle Long's family, including brother William Lindsay Long, moved to the middle portion of Mackay's Gravois land around 1807. William Lindsay Long may have acquired the Gravois farm as a gift from his father in honor of his marriage to Elizabeth Sappington, but no transaction was recorded.[11] On December 30, 1811, an exchange of 167 arpents of land was made between James

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[4] KSL, *White Haven*, 10. "The Arpent is a colonial French measurement of area equivalent to 0.8506 acres." The abstract for the White Haven property consistently spells arpent as "arpen" however.

[5] St. Louis County Recorder of Deeds, Book B, 434.

[6] CMLAV Inc., *Ulysses S. Grant National Historic Site* (site plan drawing) prepared for the NPS (NPS Drawing Number 357/80004) (28 July, 1992). Since this is the first site plan plotted to computer, it is assumed that the 9.415 acres is more accurate than previous site surveys of approximately 9.6 acres.

[7] KSL, *White Haven*, 11-12. Little notes that John Murphy and George Crump are possible squatters or tenants.

[8] St. Louis County Recorder of Deeds, Archive 1113, Volume 4, 41. Although his given name is indicated as "Jacques" in the recorded land transaction, it is held that James Mackay is that person.

[9] Little, *White Haven*, 12, Note 30. John Murphy to James Mackay, sale of improvements, 23 November, 1803, Vol. 4, Book 1, 58, Instrument 1143, St. Louis Colonial Archives, MHS.

[10] KSL, *White Haven*, 12-18.

[11] Elinor Martineau Coyle, *Old Saint Louis Homes, 1790-1865: The Stories They Tell* (Satin Louis: The Folkestone Press, 1964, 1979), 43, (hereafter cited as Coyle, *Old Saint Louis Homes)*. William Lindsay Long and Elizabeth Sappington married in 1808. William Lindsay Long's land may have been surveyed before he purchased it. The abstract for a 10 December, 1811, land transaction from Mackay to John Long describes the location of two of William Lindsay Long's property corners in relationship to John Long's property. Yet William Lindsay Long's property purchase was not recorded until twenty days later. St. Louis Recorder of Deeds, Book D, 92.

Mackay and William Lindsay Long.[12] The abstract indicates that at the time of the land transaction William Long resided on "...about two or three acres North-West of the Prairie Spring..." The mentioned spring is believed to be the one that now flows at the north border of the present historic site. Clearly, structures were present near, or on, the present parcel of property in 1811; the structures were more than likely small cabins of log or timber frame construction. Long is credited with construction of the two story portion of the existing Main House structure that remains today. He may also have been responsible for constructing a log barn on the site.[13]

William Lindsay Long maintained ownership of the property until he sold his entire 167-arpent tract of land for $3,000.00 under a warrantee deed to Theodore Hunt on March 14, 1818.[14] Four days later Hunt secured a mortgage consisting of two notes for $1,000.00 each to William Lindsay Long for the same property. The notes were due on January 18 and October 18, 1820.[15]

Hunt was schooled as a United States naval officer and spent over a decade at sea prior to acceptance of command of his own vessel. During his time abroad he engaged in several private sailing ventures in Europe, Africa, India, and throughout the Far East. In 1814 he established himself with his father's assistance in real estate speculation, and married Anne Lucas. A duel between Anne Lucas' brother, Charles, and Thomas Hart Benton precipitated the Hunts' move away from St. Louis. In 1817 Benton fatally wounded Charles Lucas. Fearful of Benton, the Hunts sought a home in a secluded place away from the city frequented by Benton.[16]

There are indications that the Hunt's occupied the property several weeks prior to the dating of the deed, and may have been responsible for finishing the house begun by William Lindsay Long. In a letter dated January 28, 1818, from Anne Lucas Hunt to her father J.B.C. Lucas, she indicated some of the details concerning the house in which they were to live:

> Mr. Hunt has bought Wm Long's farm on the gravois, which we intend removing to on the first of April-it is about 3 miles from Wilson O. Hunts mill, it has 50 acres of land, and in good fence 10 acres of which, is meadow, and a small crops of wheat, in the ground; a new frame house 36 feet, by 20, two stories high-galleries up and down in front, finished all but, the flooring, chimnies and plastering;...[17]

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[12] St. Louis Recorder of Deeds, Book D, 137.

[13] Anne Lucas Hunt, Letter to J.B.C. Hunt, 28 January, 1818, St. Louis, MHS, Lucas Collection. The described barn may be the one seen in Figure 2.6 in front of the Grant-ordered barn constructed around 1868.

[14] St. Louis County Recorder of Deeds, Book G, 114.

[15] St. Louis County Recorder of Deeds, Book H, 82.

[16] KSL, *White Haven*, 25-28.

[17] Anne Lucas Hunt Letter to J.B.C. Hunt, 28 January, 1818, St. Louis, MHS, Lucas Collection. The reason for the discrepancy between the 167 arpents (142 acres) of land indicated in the deed description and Anne Lucas Hunt's account of 50 acres is unknown. Perhaps Anne did not know the exact quantity of land she and her husband purchased from Long, and simply guessed at the size of their holdings in her letter.

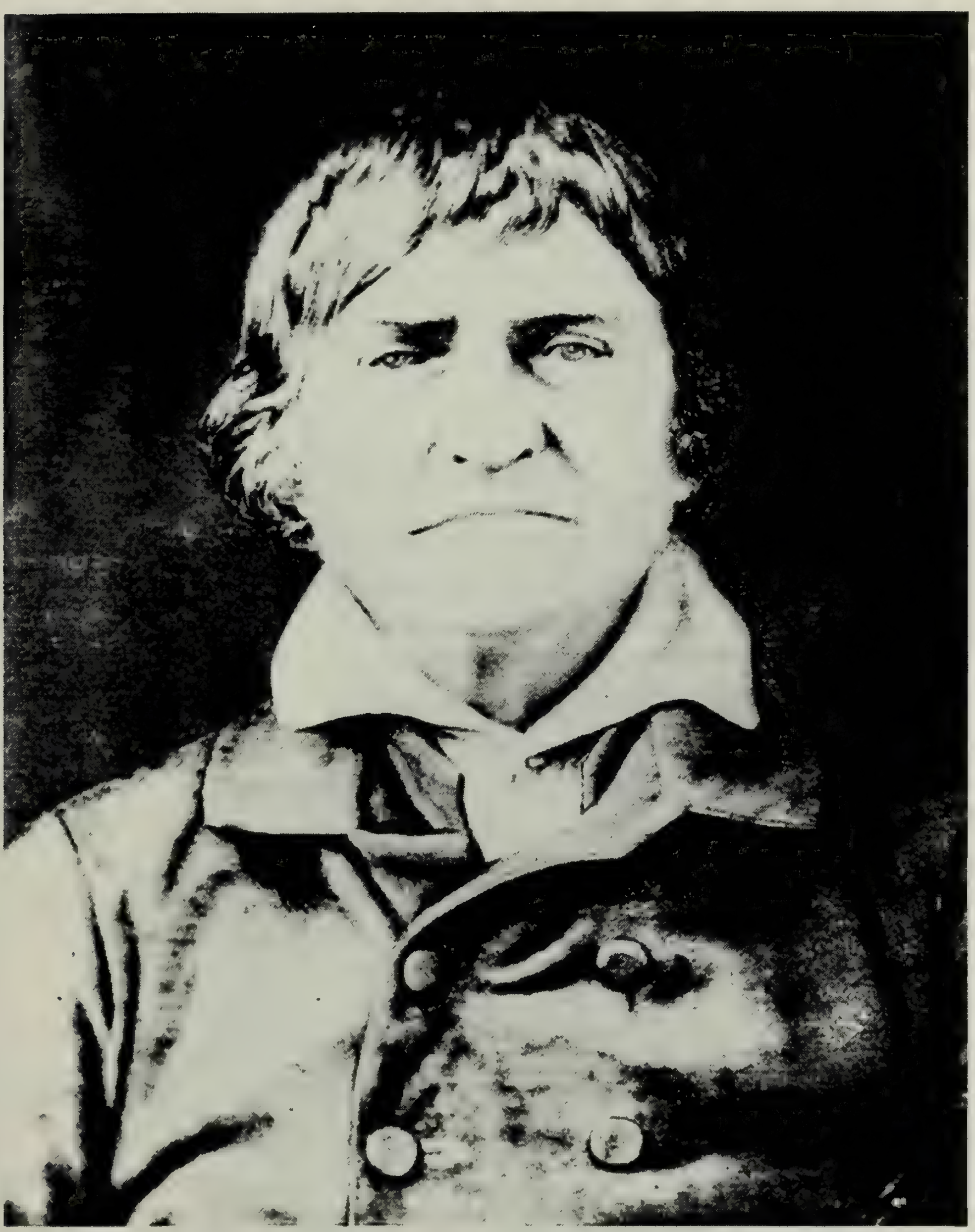

Figure 2.45 - William Lindsey Long. (Printed by permission of Missouri Historical Society).

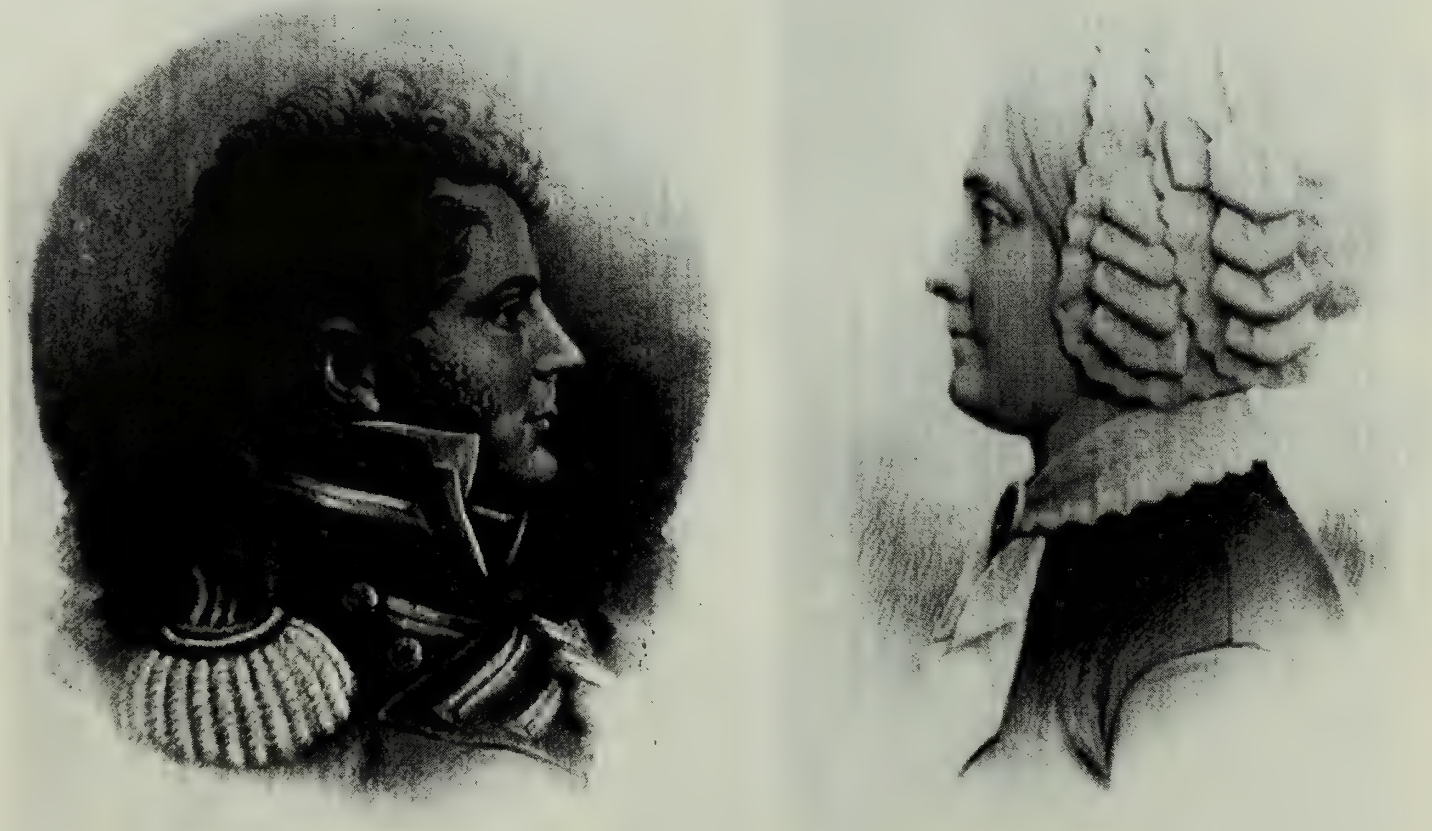

Figure 2.46 - Theodore and Anne Lucas Hunt. (Both images printed by permission of Missouri Historical Society).

The house she described is identical in character to the house later known as White Haven. However, it appears that William Long never completed the structure, and may have in fact never lived in it due to its unfinished condition. Clearly, by the time Hunt occupied the land, the place was operated as at least a subsistence farm. The Hunts are believed to be responsible for a two-room addition at the northeast corner of the house now designated as the Hunt Addition.

On March 18, 1820, Hunt secured a mortgage to John Mullanphy for $4,000.00, due February 9, 1821, with 10% interest.[18] On June 22, 1820, a bond for deed in the amount of $6,000.00 was conveyed to Frederick Dent for the 167-arpent tract of land owned by Hunt, plus 17 arpents previously conveyed to Hunt by John Long. A warrantee deed for the land was issued to Dent by Hunt and his wife on February 19, 1821.[19] This transaction commenced 45 years of Dent family occupation, gradual expansion of surrounding landholdings, and improvement of the land and buildings including the Main House. Dent called his new place White Haven, in honor of a family plantation in Maryland.[20] It is believed that the property in general, and not the house in specific was referred to as "White Haven."[21]

Frederick Dent was born in 1786 or 1787 in Cumberland, Maryland, to George Dent and Susannah Dawson Cromwell, and moved to Pittsburgh in 1802 soon after his father's death. With his brother's assistance he was sent on a trading mission into Spanish Louisiana where he was introduced to Missouri. For the next fifteen years he travelled between Pittsburgh and St. Louis, trading with Native Americans. Taking time out to join the militia for the War of 1812, Dent eventually made his way back to Pittsburgh and married Ellen Bray Wrenshall. In 1817 Frederick, Ellen, and their one year old son, John Cromwell, traveled by raft to St. Louis with the intent of establishing a business.[22]

The Dent family apparently used White Haven a summer residence for the first five or six years, preferring to live full-time in St. Louis to conduct his business.[23] When the Dents permanently moved to White Haven in 1827 they had five children including Julia Boggs Dent who was born

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[18] St. Louis Recorder of Deeds, Book J, 117. Apparently, Hunt did not abide by the terms and sold the 167 arpents to Frederick Dent without paying down the note. On 23 December, 1824, Mullanphy withdrew a suit against Dent for "certain money considerations" if Mullanphy agreed to "never take any steps to foreclose mortgage of Hunt to Mullanphy." St. Louis Recorder of Deeds, Book N, 439.

[19] St. Louis Recorder of Deeds, Book K, 58.

[20] Little, *White Haven*, 31. Julia Grant recalled in her memoirs that the place was named after an ancestral English town. JDG, *Memoirs*, 43.

[21] For the purposes of this document, "White Haven" describes the property, and "Main House" describes the house that now stands. In the context of most historic correspondence relating to the site, the term "White Haven" seems to apply to the overall property rather than the house specifically.

[22] KSL, *White Haven*, 32-35.

[23] JDG, *Memoirs*, 43.

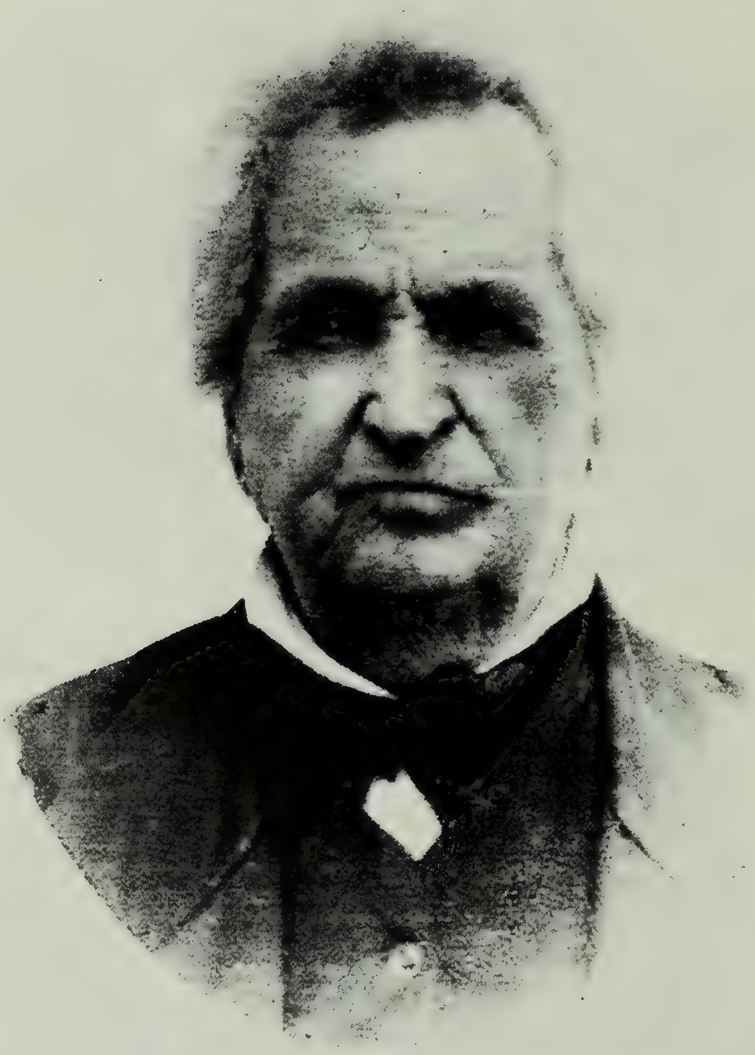

Figure 2.47 - Frederick Dent, circa 1870. (Printed by permission of Missouri Historical Society).

1826. By 1836 three more children were born but one died in infancy.[24] The Dents had 18 slaves by 1830, which demonstrates that the farm may have been productive beyond subsistence. In time Frederick Dent developed a fondness of farming over his mercantile business.[25]

Nationwide financial panics may have been an economic burden to Dent by 1840 as demonstrated by his dwindling real estate holdings, frequent mortgages, and decreased numbers of slaves.[26] In 1846 Dent attempted, but failed, to sell his farm on the Gravois when he advertised 400 acres of land, a dwelling containing nine rooms (Main House), and various other structures.[27] The family may have left the farm between 1847 and 1849 having leased a house in St. Louis. To confuse matters, a legal dispute arose over the precise ownership of 100 acres of land that Dent thought to be his. Frederick Dent's financial status must have improved however, for by 1850 thirty slaves labored on his farm and he accumulated nearly 900 acres of land.[28]

Dent is believed responsible for several improvements on the house including the West Wing, rear porch, and perhaps the East Wing. In addition, a stone summer kitchen (Stone Building HS-2), an ice or smoke house (Ice House HS-4), and a spring house (demolished), are believed to have been constructed by Dent during his ownership.

After reporting for duty at Jefferson Barracks, Ulysses S. Grant first visited White Haven late in 1843 at the invitation of West Point classmate Fred Dent. It was there that he eventually met Fred's sister, Julia, which initiated a ritual of frequent courtship at the farm. Grant's involvement with the Mexican War curtailed his visits from 1845 until 1848 when he was granted four months leave. On August 22, 1848, Ulysses and Julia were married at the Dents' St. Louis townhouse, but their stay in the city was brief as Grant was ordered to report for duty to Detroit, Michigan, in November. From that time until 1854 Grant was shuffled from military post to military post along the Great Lakes and the West Coast.[29] Julia returned to White Haven in 1850 to deliver their first child, Frederick Dent Grant.[30] Their second son, Ulysses S. Grant, Jr., was born in Ohio in 1852 while his father was traveling to the West Coast.[31] Frustrated by separation from his family, Ulysses resigned his commission and made his way back to Missouri.

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[24] JDG, *Memoirs*, 30 and 33. The Dent children included John Cromwell (1816-1889), George Wrenshall (1819-1899), Frederick Tracy (1820-1892), Lewis (1823-1874), Julia Boggs (1826-1902), Ellen (Nellie) Wrenshall (1828-1904), Mary Dent (died in infancy), and Emily (Emma) Marbury (1836-?).

[25] KSL, *White Haven*, 38 and JDG, *Memoirs*, 43.

[26] KSL, *White Haven*, 40. In 1840 Dent held thirteen slaves. A particularly severe panic occurred in 1837.

[27] "Improved and Unimproved Land for Sale," *Missouri Republican*, 5 August, 1846.

[28] KSL, White Haven, 41-43. Missouri agricultural census, 1850, St. Louis County, Carondelet Township, Missouri Historical Society.

[29] KSL, *White Haven*, 84-85.

[30] KSL, *White Haven*, 87.

[31] KSL, *White Haven*, 90.

Grant was reunited with his family at White Haven in 1854, and began to assist Julia's aging father in operating the White Haven farm.[32] Their first and only daughter, Ellen Wrenshall, was born on July 4 the year after his return. The Grants apparently lived at Main House for a time until they moved to Wish-ton-wish in 1855, the stately stone home constructed by Julia's brother Lewis at the western end of White Haven property. The family received about 100 acres of land from Julia's father near what is now St. Paul Cemetery.[33] In the summer of 1856 they proceeded to construct a two-story dogtrot log house which they called Hardscrabble, and to prepare land for cultivation.[34] Their stay in the new home was short; as the Grant family moved back to the Main House to help Frederick Dent upon the death of his wife Ellen on January 14, 1857. From then until late 1858 Grant lived and labored at White Haven. Their fourth and final child, Jesse Root Grant (II), was born at the house in 1858.[35]

There are indications that Dent and Grant farm finances were not all that stable. On June 26, 1858, a deed of trust was filed conveying over 862 acres of White Haven property from Frederick Dent to Henry Boggs, trustee to J.G. McClellan.[36] A letter from Ulysses to his father, Jesse Root Grant, also confirms that Frederick Dent intended to close down his farming operation.

> Mr. Dent and myself will make a sale this fall and get clear of all the stock on the place, and then rent out the cleared land and sell about four hundred acres of the north end of the place.[37]

The chain of title records that Dent failed to honor the notes, and so the deed of trust was foreclosed at public auction on September 10, 1861. The debt was apparently satisfied through sale of about 271 acres of land at the north end of the 862-acre White Haven tract. Dent's eldest son, John C., was the highest bidder at $4,226.92 and so received the property.[38] However, in a later land transaction record, all 862 acres were deeded to Ulysses Grant by Frederick Dent.[39] To further confuse the incident Dent apparently had Grant compose a deed transferring some of Dent's land to one John Stewart, and arrange for a boundary survey.

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[32] KSL, *White Haven*, 105.

[33] St. Paul Cemetery is located along Rock Hill Road between Watson Road and Laclede Station Road.

[34] The dogtrot was enclosed with siding to create a central hall. KSL, *White Haven*, 111. The cabin has been moved at least three times, including for an appearance at the 1904 St. Louis World's Fair. It is currently located on adjacent Grant's Farm property.

[35] KSL, *White Haven*, 116.

[36] St. Louis County Recorder of Deeds, Book 205, 151. Four notes were issued for $200.00, each due in even dates at between 6 to 24 months, and one note for $4,000.00 at two years. Henry Boggs, cousin of Julia Dent on her mother's side, later became Ulysses's real estate business partner. KSL, *White Haven*, 11.

[37] USG, *Papers*, 1:344. 1 October, 1858.

[38] St. Louis County Recorder of Deeds, Foreclosure of Deed of Trust, dated 10 September, 1861.

[39] St. Louis County Recorder of Deeds, Book 365, 402; KSL, *White Haven*, 118; and USG, *Papers*, 2:20n. Simon's note indicates that White Haven was sold in 1858, but Little contends Simon is in error. The 1858 transaction included a 51 arpent portion of the Spanish land grant, or Survey No. 9, first owned by Hugh Graham. It is unknown at this writing if the current 9.415 acre historic site is included within that transaction, as the abstract is not at all specific about where the 51 arpents was located with respect to ordinal survey landmarks. Since the transaction included

> At Mr. Dent's request I called upon the County surveyor to come out here and run the line between your land and his. Tuesday next is the day set for doing it and I give you the earlyest notice practicable.[40]

In May of 1860 Grant and his family separated themselves from their St. Louis ties and moved to Galena, Illinois, to go into partnership with his brother Orvil in a family leather enterprise.[41] His Galena stay was short-lived, when the outbreak of the Civil War in April of 1861 awakened Grant's patriotism.[42] Grant was stationed in Springfield, Illinois to muster in the volunteers and serve as a special aid to the governor.[43] Being so close to St. Louis, he frequently visited the city and White Haven.[44] Grant eventually evolved from an appointed colonel in the 21st Illinois Volunteers to one of the most celebrated generals of the Civil War. Frederick Dent continued to live on the farm at least through 1865, although the farm land was probably leased and tilled by others.[45]

Around 1865 Grant began to acquire Frederick Dent's landholdings in St. Louis and Jefferson Counties, including Hardscrabble that he traded for a house in St. Louis in 1859. The reason or reasons why Grant initially accumulated Dent property is unclear. Perhaps it was because of father-in-law Frederick Dent's failing health and incapacity to continue making a living,[46] or maybe it was Dent's inability to pay county taxes on the land.[47] Whatever the reason, Grant began to pay the taxes Dent owed and purchase the property. However, he initially did not seem interested in holding White Haven, and there are indications that his intentions to assist Dent were more charitable in nature.

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the northeast and northwest quarters of Section 16 which shares the north boundary line of Survey No. 9, it is very possible that the transaction included the present historic site property. The intermingled use of arpents and acres, the ambiguously plotted "Survey No. 9," vague location descriptions in recorded land transactions, and the past use of long gone trees and rocks as landmarks contribute to the complexity of tracing boundary changes for the site.

[40] USG, *Papers*, 1:345. USG Letter to Harrison Long, 16 October, 1858. Simon notes that the transaction took place on 1 November, 1858, and that Grant signed as witness on 9 November, 1858. Simon mistakenly cites the letter as being written to John Fenton Long.

[41] KSL, *White Haven*, 125.

[42] USG, *Papers*, 2:6-7, USG Letter to Jesse Root Grant, 21 April, 1861.

[43] Ulysses S. Grant, *Personal Memoirs of U. S. Grant* (New York: Charles L. Webster & Co., Vol. I: 1885, Vol. II: 1886.), 154-155.

[44] KSL, *White Haven*, 131.

[45] USG, *Papers*, 14:145, USG Letter to Charles W. Ford, 12 March, 1865. "I have just learned that the farm on which Mr. Dent is living is not to be sold until next Sept."

[46] USG, *Papers*, 1:345, USG Letter to Jesse Root Grant, 1 October, 1865; 16:220, JDG Telegram to USG, 5 September, 1866. Apparently, Frederick Dent's health began to deteriorate around 1856, but most notably in 1866 when he suffered a "stroke of paralysis."

[47] USG, *Papers*, 16:6, USG Letter to Charles W. Ford, 11 January, 1866. "A letter just received from Judge Dent leads me to fear that his financial affairs endangers his land adjoining the house where he lives on the Gravois Road."

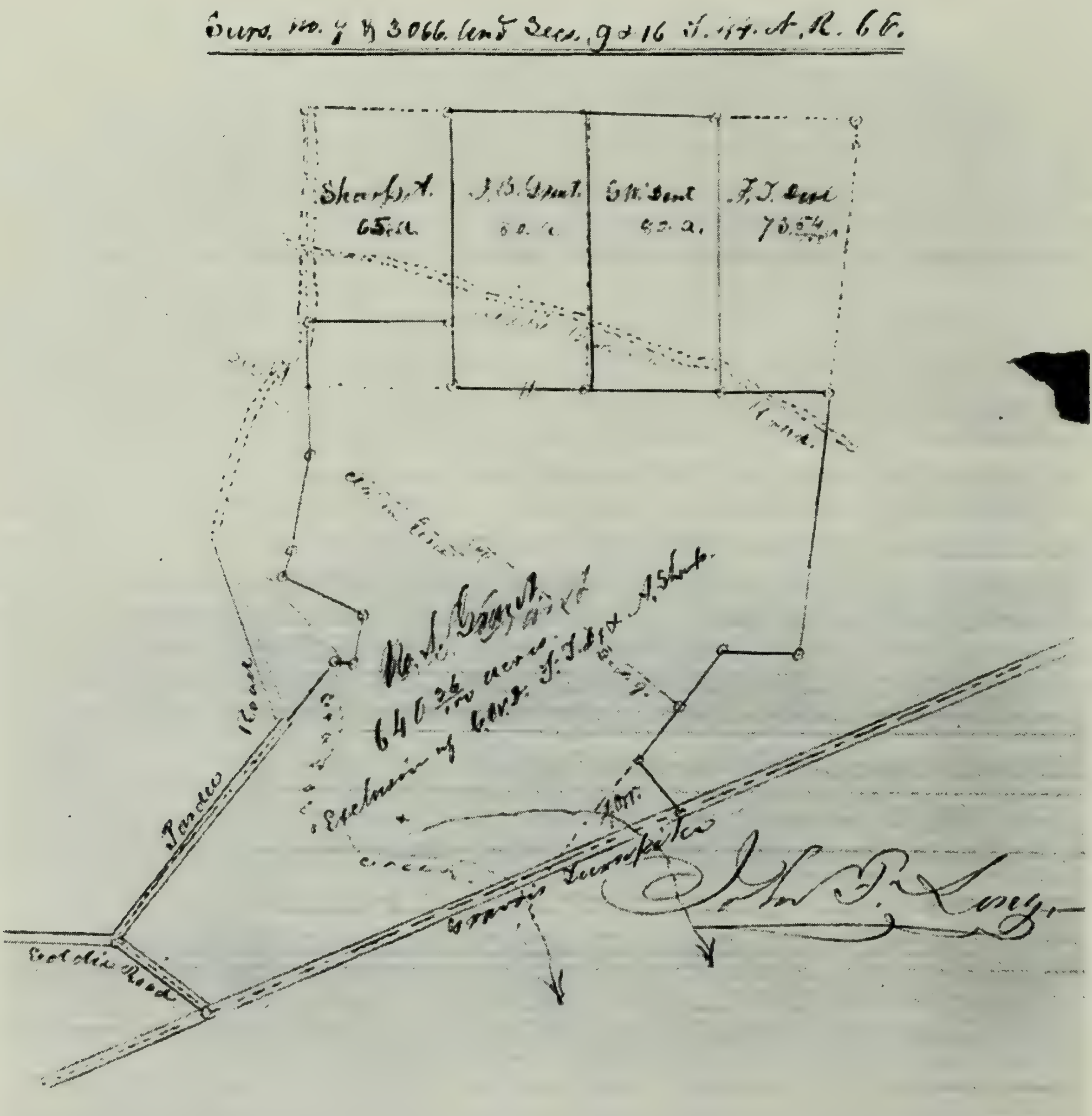
Surv. No. 7 & 3066 and Secs. 9 & 16 T. 44 N. R. 6 E.
Sharp, A.
65 a.
J. B. Grant
640 acres
Gravois Turnpike
John P. Long

Figure 2.48 - Hand-drawn survey map of White Haven. Ulysses S. Grant prepared this map of his St. Louis farm while serving as President. (Printed by permission of Missouri Historical Society).

> I really do not want any land but rather than to see it sacraficed will buy at its full cash value paying cash down.[48]

By 1866, Frederick Dent had vacated White Haven, possibly moving to St. Louis, and the house was then occupied by a tenant named Kesselring.[49] Grant's feelings toward owning the land apparently changed in 1866 when he hired tenant William Elrod to manage the place.[50] Grant continued accumulating Dent and adjacent land. By 1873 White Haven boundaries extended to over 1,000 acres to include Hardscrabble, Grant's former cabin, and Wish-ton-wish, the home of his brother-in-law Lewis Dent.[51] He even seems to have developed long-term objectives for the farm when he wrote to Elrod on March 31, 1867:

> I do not want to put more than $5000 00 more money in the place... All income from the place for the next ten years however I expect to spend on it.[52]

Around summer of 1868, William Elrod and his family moved to the Main House, the home that served the Dents well for 45 years had become a tenant house, as directed by Ulysses S. Grant.[53] Although Grant initially intended to visit his farm for "several months each year," there is evidence that he may have spent only one or two weeks out of each year at the place.[54] He also had no intention of residing at the Main House, instead choosing the more formal Wish-ton-wish.

> The house I intend you [Elrod] to occupy permanently is in the middle of the place. It is the house occupied by my father-in-law for the last forty years. This place was leased out before I purchased it however and although I offered the tenant $500 00 to give up his lease, which has but one year to run, he refuses to take it.[55]

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[48] USG, *Papers*, 16:6, USG Letter to Charles W. Ford, 11 January, 1866.

[49] USG, *Papers*, 17:314 USG Letter to WE, 4 September, 1867. "...but I think you had better not move [from Hardscrabble] until you can get the house now occupied by Kesselring."

[50] USG, *Papers*, 16:375, USG Letter to Jesse Root Grant, 7 November, 1866. Elrod was the husband of Grant's cousin Sarah Simpson, daughter of Samuel Simpson.

[51] LeRoy H. Fisher (editor), "Grant's Letters to His Missouri Farm Tenants," *Agricultural History* (21 (1947): 26-42) , 27 (hereafter cited as Fisher, *Grant's Letters*). Although Grant purchased the bulk of his land by 1867, he continued to add to his holdings by purchasing land surrounding White Haven. "Big Fire - Grant's Farm in Flames," Newspaper article translated by Marie Holtz, *Westliche Post Mississippi Blatter*, 23 February, 1873. The article indicates that Wish-ton-wish was constructed between 1848 and 1849.

[52] USG, *Papers*, 17:94.

[53] USG, *Papers*, 18:263, USG Letter to WE, 27 May, 1868. "I want you to take possession of W. Dent's and Gen Dent's lands, collect the rent, and as soon as possible get all tenants off the places." Elrod was living at Hardscrabble up until that point.

[54] USG, *Papers*, 17:90, USG Letter to Charles W. Ford, 24 March, 1867.

[55] USG, *Papers*, 17:27, USG Letter to WE, 15 January, 1867; 18:559, USG Telegram to Helen Barrett, St. Louis, 6 May, 1868. "My family expect to occupy Wishton Wish this Summer."

While President, Grant continued to manage the site from Washington, D.C., through numerous letters to his tenants. There are indications that Grant intended to return to White Haven upon retirement, but he never did so.[56] In addition to sending thoroughbred horses and prize cattle to the farm, he ordered the construction of new stables, barns, a lime kiln, fences, and other outbuildings; one barn, constructed in 1868, remains today. Grant's correspondence with regard to details of work on White Haven is lean at best; he directed his hired tenants as to where they were to live and gave few orders on rehabilitating their White Haven quarters. In a November 24, 1870, letter to his tenant, Grant ordered Elrod to construct "...a large addition to your house to accommodate the increased number of hands you will have to keep."[57] It is doubtful that this "large addition" was ever constructed as there is no evidence that anything other than two small rooms enclosing a portion of the rear porch were added to the house after 1860. However, the letter does reveal that Grant intended persons, in addition to Elrod's family, to live in the house. By 1870 Elrod, wife Sarah, and their six children apparently shared the Main House with farm laborers Nicholas Talbert and Egbert Jones.[58]

Grant intended to visit the farm for an extended period at least once yearly. When he was able to travel to White Haven he seems to have enjoyed the stay, although the number of visits was limited due to the rigors of his duties back east.[59] Even then, he and his family intended to stay at Wish-ton-wish rather than White Haven or Hardscrabble.[60] But the transient use of Wish-ton-wish may have been for practical, rather than personal preference. Grant recognized that the Main House was centrally located with respect to his land holdings, and therefore more useful to his tenant in managing the farm.[61]

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[56] Horace Porter, *Campaigning with Grant* (New York: Da Capo Press, Inc., 1986), 167. Porter quotes Grant as saying during a Civil War battle;"I am looking forward longingly to the time when we can end this war, and I can settle down on my St. Louis farm and raise horses." However, there is yet no other documentary evidence that Grant intended to retire to St. Louis after the war.

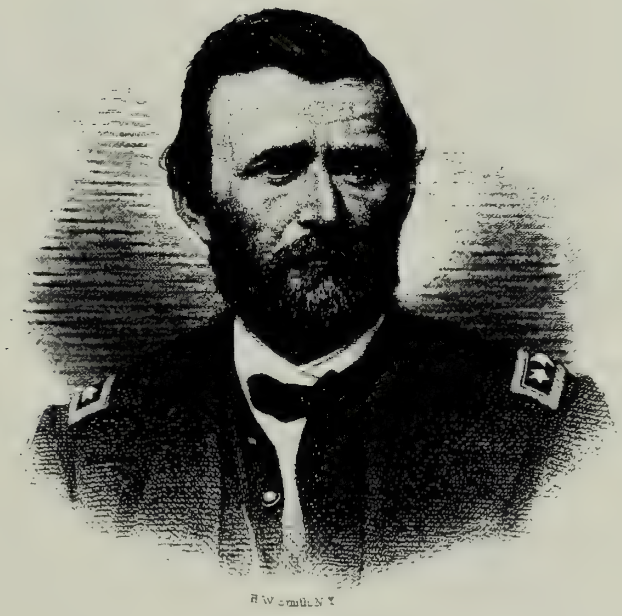
[57] Fisher, *Grant's Letters,* 34.

[58] Federal Census, St. Louis County, Carondelet Township, 1870, Missouri Historical Society.

[59] USG, *Papers*, 18:188, USG Letter to WE, 10 March, 1868. "I should have been in MO. by this time but for the impeachment of the President."

[60] USG, *Papers*, 18:304, USG Letter to WE, 23 June, 1868. "I expect to be in St. Louis about the 6th of July and will Keep house while there. If you can engage me a good white woman for cook during our stay I will be very glad of it." *Fisher, Grant's Letters*, 31, USG Letter to WE, 24 August, 1868. "Have you fixst the carpets & furniture at my house? Mrs. Grant thinks camphor should be sprinkled in the carpets." Fisher notes that USG referred to Wish-ton-wish.

[61] USG, *Papers*, 17:27, USG Letter to WE, 15 January, 1867. "...there are three good houses. One at the end of the place furthest from St. Louis is a fine house well furnished. It is not properly situated for any one to live in to attend the farm the body of the cleared land being from one to two miles distant from it. Besides I want to keep that to occupy a few weeks each year myself." Wish-ton-wish was the house furthest from St. Louis at the south end of the property.



U. S. Grant

Figure 2.49 - Ulysses S. Grant. (Engraving from J. T. Headley, *The Great Rebellion: A History of the Civil War in the United States*, (Hartford, Connecticut: American Publishing Company, 1866), Vol. II, plate proceeding page 286).

Around 1872 a 100-foot wide strip of land which passed near the house was conveyed to the Pacific Railroad for construction of the Carondelet branch rail road.[62] The route surely made a handy means of transporting Grant's livestock to the farm from elsewhere in the United States.

Grant continued to support and manage the farm operation with whatever funds he could spare, constantly sending livestock from the east to his stables. In an 1871 letter, Grant disclosed to Elrod that he had received reports from other sources that all was not well down on the farm, but for unknown reasons, Grant dismissed the reports as lies.[63] He may have changed his opinion by early 1873 when he expressed concern that he had not heard from Elrod in several months.[64] By October 1873, Grant hired a new tenant, Nat Carlin, and discharged and ordered Elrod to remove himself from White Haven.[65]

It is unknown if Carlin immediately moved into the Main House as he apparently kept residence near Webster Groves, the city and post office to which Grant's letters were mailed to him.[66] However, by the time Carlin had been hired, Wish-ton-wish was destroyed by fire which precluded Grant and his family from ever staying there again.[67] But Grant still directed that the Main House be used to board hired hands, and by the end of 1874 Carlin had apparently also moved into the house.[68]

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62. St. Louis County Recorder of Deeds, Book 494, 244. The only documentation yet found concerning the railroad right-of-way on Grant's property is a quit claim deed from John Matthews to Pacific Railroad. The abstract indicates that the right-of-way "...extends through the entire tract leased by Matthews of Harrison L. Long. And the other tract is another strip of 100 feet in width ...leased by said Matthews of U. S. Grant..." The quit claim deed released Matthews from any claim or interest he may have had while leasing the land. The deed includes $165.00 compensation to Matthews for unspecified reasons, but it is suspected that Matthews was compensated for termination of the lease. Long was responsible for tending some of Grant's St. Louis affairs while Grant was President, and was a landholder neighboring Grant's White Haven property. Little is known of Matthews however. Searches through St. Louis City and County directories for Matthews under various spellings yielded no substantive information. However, in Harrison Long's last will involving partitioning of real estate, dated 14 September, 1875, Margaret E. Mathews is listed as Long's deceased daughter. John Matthews may have been Long's son-in-law, and, therefore, Matthews may have been employed by Long in some of his affairs. Interestingly, William Elrod is indicated as a witness to the will. Elrod, former tenant of White Haven, was relieved of his position by Grant in 1873 (St. Louis County Recorder of Deeds, Book "L", page 163). In a document dated 31 May, 1880 partitioning Harrison Long's estate landholdings, the surnames of John and Margaret are consistently listed as Matthews (St. Louis County Recorder of Deeds, Vol. 3 page 356). There is no documentary evidence yet uncovered that Grant was aware of or influenced the land transaction, although he must have known about it. But the facts remain that Grant was shipping livestock to the farm from all over the country, a railroad made an efficient means of transporting livestock, and the railroad was placed only 200 feet from his horse barn.

63. *Fisher, Grant's Letters*, 35, USG Letter to WE, 30 July, 1871.

64. *Fisher, Grant's Letters*, 37, USG Letter to WE, 27 February, 1873.

65. *Fisher, Grant's Letters*, 38, USG Letter to Nat Carlin, 27 October, 1873. Fisher notes on page 38 that Carlin was in the employment of the United States Express Company, and possibly under the employment of Charles W. Ford.

66. The Webster Groves post office was the closest to White Haven until a post office was established in Affton on 17 October, 1876. There was a post office in Sappington, but it was located in the Postmaster's home until 1889, and may not have had as many services as the Webster Groves post office. Mail was sent directly to Webster Groves from downtown St. Louis, whereas Sappington mail arrived from Jefferson Barracks. Ross Wagner to Carolyn Buckner, December 1994.

67. "Big Fire - Grant's Farm in Flames." The house burned on or about 22 February, 1873.

68. Fisher, *Grant's Letters*, 38, USG Letter to Nat Carlin, 28 November, 1873. "If you have hands to board you will require all the room in the house." Fisher, 41, USG Letter to John F. Long, 29 November, 1874. "He [Carlin] finding everything himself except he has the house to live in..."

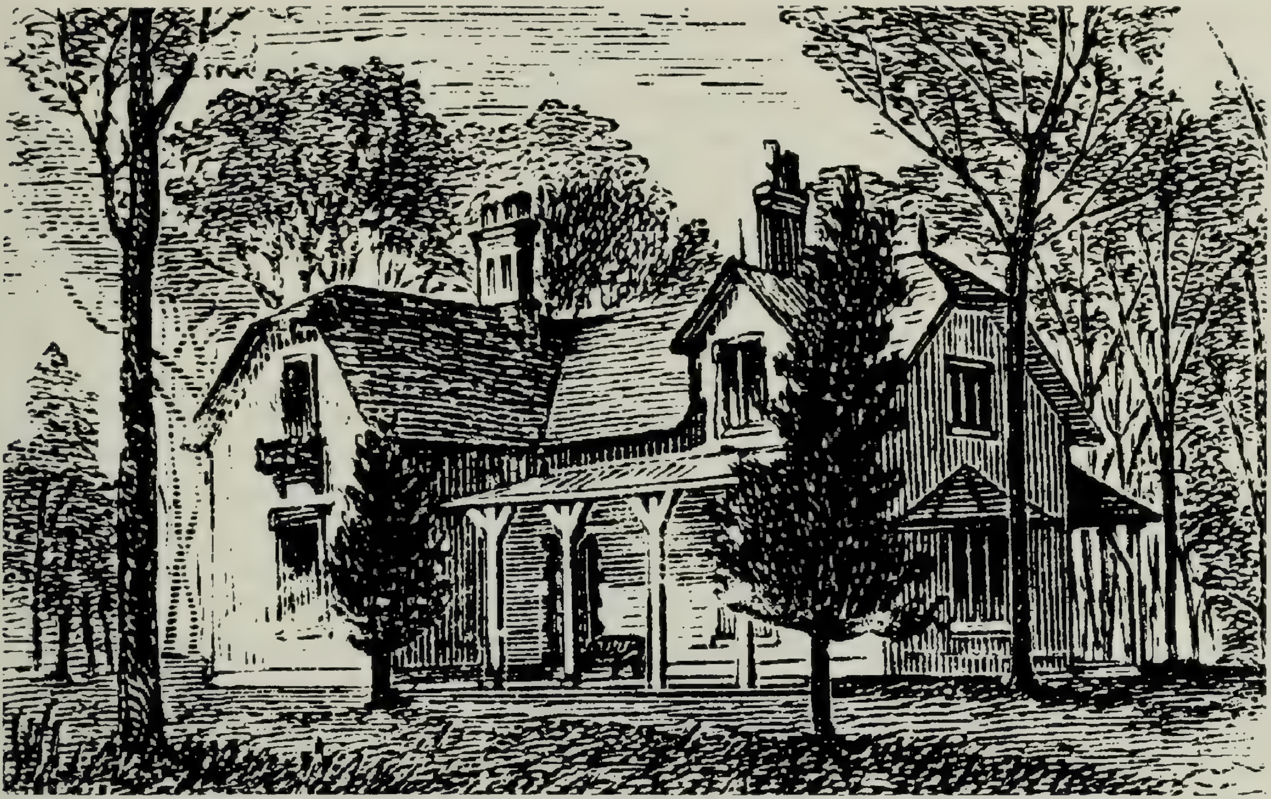

Figure 2.50 - ""Wish ton wish" - Dent Farm, 1856." Grant and his wife stayed at Wish-ton-wish when they visited St. Louis during his presidency. The home was constructed by Julia's brother on White Haven property during the 1850s, and destroyed by fire in 1873 (see Figure 2.6, "Ruins of Former Residence"). (Detail taken from engraving in Albert D. Richarson, A Personal History of U.S. *Grant, (Hartford, Connecticut: Ameri*can Publishing Company, 1869), plate proceeding page 150, ULSG collections).

Grant's virtual disinterest in his St. Louis farm seems to coincide with judgments handed down to close friends and associates at the close of the 1875 "Whiskey Ring" scandal.[69] Volatile produce prices and the expense of operating a farm from afar may have also contributed to his sudden decision to bail out of the enterprise.[70] In late 1875 Grant ordered Carlin to sell all livestock and possessions, lease the farm, and collect his final pay.[71] For all practical purposes Grant segregated himself from the property. The place continued to be farmed under lease and the Main House was occupied by tenant Henry Conrad B. R. Leis and his family between 1877 and 1894 (Figure 2.8).[72]

Ulysses Grant served two presidential terms between 1869 and 1877, and became the first United States president to circumnavigate the earth on a tour of nations. Around 1881 Grant invested heavily in a banking business with Ferdinand Ward, a partnership that led to Grant's loss of his White Haven property. In May of 1884, Ward asked Grant for a loan to prevent one of the banks where they conducted business from collapsing. Grant arranged for a loan of $150,000 from friend William Vanderbilt, using the White Haven property as collateral. Unfortunately, Grant soon discovered that Ward left the country with the money.[73] Although Vanderbilt quietly resisted taking Grant's property, Grant insisted that the deed of trust be transferred to Vanderbilt.[74] On April 15, 1885 a quitclaim deed from Ulysses S. and Julia Dent Grant to William J. Van Arsdale, agent to Vanderbilt, was recorded for the White Haven property.[75] Ulysses died soon after on July 23, 1885 of throat cancer at Mount McGregor, New York.

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[69] KSL, *White Haven*, 251-252.

[70] KSL, *White Haven*, 260.

[71] Fisher, *Grant's Letters*, 42, John F. Long Letter to Nat Carlin, 13 October, 1875.

[72] Gladys Farley Walker, Ellen Farley Monaghan, and Vivian Farley Israel, *Farley-Lies Family* (St. Louis: Genealogical Research and Productions, n.d.), 49-50 (hereafter cited as Walker et al, *Farley-Lies Family*).

Vanderbilt maintained the property for three years, apparently changing neither the tenant nor the buildings.[76] On July 12, 1888, a quit claim deed for 640 acres of the White Haven property was recorded from Vanderbilt to Luther Conn for $31,988.50 through a series of transactions.[77] Ironically, Conn fought for the Confederacy during the Civil War. He "indulg[ed] his tastes for fine horses and cattle" during his ownership of the property from 1888 until about 1905.[78] There is little evidence that Conn substantially modified any of the structures that remained when he bought the place, and he may not have even lived in the house.[79] He apparently kept the place in good condition however.[80]

At the turn of the twentieth century there was a call by Grant and White Haven enthusiasts to preserve the place, possibly in response to anticipated encroachment of land development projects. However, there is no evidence that any significant action took place.

> There have been suggestions among surviving veterans of the Union Army that the estate ought to be saved from the subdivision into small tracts that will ultimately be its fate, if left to private ownership, by making it a national park as a perpetual memorial of General Grant, and a visiting spot for his countrymen.[81]

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[73] KSL, *White Haven*, 272-273.

[74] St. Louis County Recorder of Deeds, Volume 25, 71.

[75] St. Louis County Recorder of Deeds, Book 30, 1. Van Arsdale acted on behalf of Vanderbilt.

[76] KSL, *White Haven*, 277.

[77] See KSL, *White Haven*, Note 4, 277.

[78] Hyde & Conrad, *Encyclopedia of the History of St. Louis* (New York: Southern History Company, 1899), 466.

[79] Walker et el, *Farley-Lies Family*, 49-50. If the duration of the Lies family occupation was from 1877 until 1895 as indicated in this publication, then Luther Conn may not have resided in the house at all.

[80] Howard L. Conrad (editor), *Encyclopedia of the History of Missouri, A Compendium of History and Biography for Ready Reference* (New York: The Southern History Company, 1901), 88.

[81] Conrad, 89.

Conn subdivided the property and sold off the southernmost portion to the anchor of the St. Louis brewing family, Adolphus Busch, in 1903.[82] "This was the section where Wish-ton-wish stood before it burned. Two years later Conn sold the core fifteen acres surrounding White Haven to James Hughes, an agent of the St. Louis Development Corporation, which in turn was associated with the Grant Park Land Company. From 1905 to 1906, White Haven changed hands four times."[83] The Corporation intended to develop White Haven as an amusement park, and proposed to construct a new trolley line from the end of the St. Louis city car line to the site.[84] However, the venture folded due to insufficient investment capital, and White Haven was allowed to deteriorate in the meantime.[85] For some years prior to 1913 the property immediately adjacent to the house was used to pasture St. Louis' garbage wagon mules.[86]

In 1913 Albert Wenzlick, head of St. Louis's oldest and largest real estate company, received White Haven by foreclosure from the Grant Park Land Company after their unsuccessful attempt to develop the property as an amusement park.[87] By that time, the White Haven property had been reduced to fifteen acres. Albert set to work rehabilitating the deteriorated house as his personal summer retreat, and immediately hired handyman Charles "Charlie" Burton Davis as his on site tenant. Charlie Davis moved his small family to White Haven from Ste. Genevieve, Missouri, in 1913, and temporarily resided in the house until a cottage was built for them the following year.[88] Portions of that original cottage are now used as park offices. Under the direction of Albert and Emma Wenzlick, Charlie set to work rehabilitating the Main House; installing previously lacking conveniences such as electrical, plumbing, and heating systems. The Davises operated the place as a full-time subsistence farm until Albert Wenzlick's death in 1937. From around 1935 until Albert's death, Ruth Abbott, daughter of Albert and Emma, moved into the house with her three children

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[82] Peter Hernon and Terry Ganey, *Under the Influence, the Unauthorized Story of the Anheuser-Busch Dynasty* (New York: Avon Books, 1991), 79. Adolphus apparently purchased the property for son August A., in August's name.

[83] KSL, *White Haven*, 278. See notes 7-8 for relevant deed records.

[84] Bill Wenzlick to Jill O'Bright, September 1, 1993. The trolley line was to begin at Hampton Avenue and Gravois Road, pass through Lakewood (thus deriving the name of "Lakewood Line"), and continue on to Rock Hill Road and Laclede Station Road.

[85] KSL, *White Haven*, 278.

[86] Marjorie Abbott Felice Letter to Save Grants White Haven, Inc. 19 March, 1986, 1. Apparently, the mules had free roam of the property, including the land immediately adjacent to the house.

[87] KSL, *White Haven*, 278; and Bill Wenzlick to the author, 12 August, 1993 and 8 December, 1994. The St. Louis Development Corporation formed the Grant Park Land Company to develop White Haven property as an amusement park. Albert apparently made a loan to the company to finance the park. Little asserts that Albert Wenzlick purchased the property from the St. Louis Development Corporation. However, Bill Wenzlick contends that Albert held a deed of trust on the property for the Corporation, and that the property was foreclosed when the Corporation went bankrupt. Albert then bought the property at the foreclosure sale.

[88] James A. and Charles R. Davis to the author, 18 March, 1993. See Division VII - Other Structures, for further information concerning the Cottage.

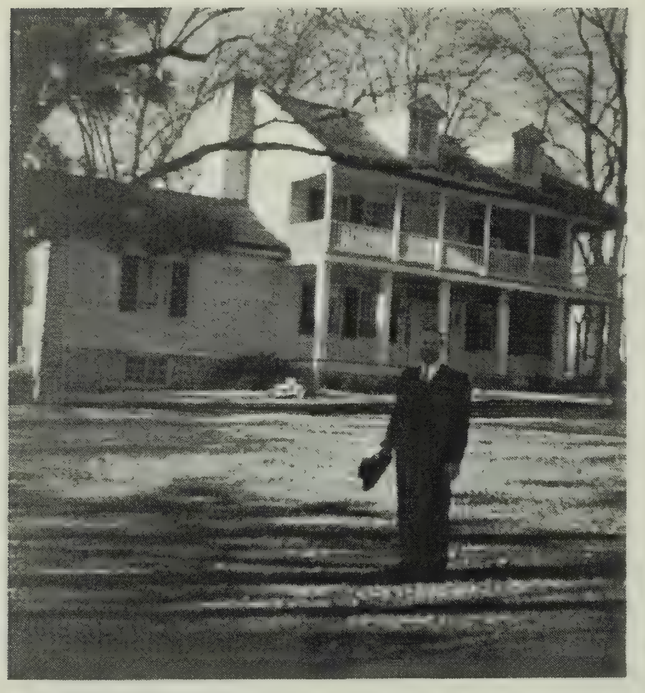

Figure 2.51 - Delbert Wenzlick in front of the Main House, circa 1950s. Delbert owned the property from 1940 until his death in 1979. (Reproduced from stereo-optic slide from Bill Wenzlick collection)

soon after the death of Ruth's husband. Emma continued to live in the house until her death in 1938, and it remained vacant for two years.[89]

It was not until 1940 that Albert's and Emma's son, Delbert Wenzlick, purchased the property from Albert's estate.[90] Up until that time, few modifications had occurred on the house over a period of 100 years. New owner Delbert intended for the place to be his full-time residence. He set out not only to repair deteriorated portions of the building, but to add up-to-date conveniences such as central air conditioning and sound systems. He wanted the interior to be a showcase for his antique furnishings, and attempted to meld the old house with contemporary living standards. In doing so, deteriorated nineteenth century additions including the Hunt Addition, East Wing, and rear porch were removed and much of the interior finishes of the remaining portion of the house were replaced or modified. During the 1950s and 1960s open pastures surrounding the 10 acres core of the property including the Main House were platted and developed with suburban ranch houses.

Between 1976 and 1978 Delbert established White Haven as a corporation in an unsuccessful attempt to sell the property to neighbor August A. Busch, Jr.[91] Delbert continued to live in the house until he died in the basement while leading a tour of St. Louis County officials on January 12, 1979. His third wife, Anne Ridgely Wenzlick, continued to reside in the house until April of that same year. Soon after, a young couple was allowed to live in the house for six to eight months rent free. John Amocapone and his wife lived in the Main House for about one year prior sale of the property. They were the last people to reside in the Main House.[92]

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[89] Bill Wenzlick to the author, 8 December, 1994. Ruth's husband died in Texas of injuries suffered during a gas attach in World War I. The children were Marjorie, Nancy, and Faith Abbott. It is unknown if Emma lived in the house full or part time.

[90] Bill Wenzlick to the author, 12 August, 1993. Albert owned well over 800 real estate properties free and clear until the 1929 Stock Market crash when most of the property was mortgaged. Frugal Albert kept records of his deals and transactions on the backs of envelopes and other scrap paper. Because of his ad hoc filing system it was not until several years after his death that his estate was settled.

[91] KSL, *White Haven*, 279; and Bill Wenzlick to the author, 12 August, 1993. Little states that the corporation was formed after Delbert Wenzlick's death to deal with the sale of the property because family members were in dispute over disposition of the property. According to Bill Wenzlick, a corporation was established so that any transaction of the land upon Delbert's death would incur substantially less taxes than if the

Delbert's heirs took possession of the property and initiated the process of selling Delbert's estate. A proposal was made in 1980 to purchase the land for the development of condominiums using the house as a focal clubhouse. Although the sale of the property was unsuccessful, the proposal raised concerns among local preservationists and historic preservation groups that another piece of history would be lost unless immediate action was taken. Save Grant's White Haven, Inc. was formed with the goal of organizing support to safeguard the property from intensive development. Through an agreement between St. Louis County and the State of Missouri, White Haven was purchased from Albert Wenzlick's estate for $510,000 on December 22, 1986, under the condition that the property be owned jointly until it could be transferred to the National Park Service.[93] Later, the State of Missouri's share of the purchase was reimbursed by the Jefferson National Expansion Historical Association.[94] Congress authorized Ulysses S. Grant National Historic Site in 1989, and the general warranty deed was transferred to the National Park Service on June 12, 1990.[95] The final note was paid by the historical association in 1994.

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property had been sold on the open market. Albert and August apparently settled a price but could not come to agreement on maintenance of the site during the period that Delbert occupied the house until his death. Bill Wenzlick stated that there was no disagreement between Delbert's direct decedents on disposition of the property.

[92] Bill Wenzlick to the author, 29 July, 1994. The young couple did not maintain the house, but the Amocapones took good care of the place.

[93] General Warranty Deed conveying White Haven from U.S. Grant's White Haven, Inc. to the State of Missouri, Department of Natural Resources, and St. Louis County, 22 December, 1986. ULSG files; and KSL, *White Haven*, 279. Little incorrectly asserts that Save Grant's White Haven, Inc. purchased the property from the Wenzlick family and gave it to the State of Missouri and St. Louis County.

Bill Wenzlick to the author, 8 December, 1994. Wenzlick contends that transfer of the property to the National Park Service was not discussed until after the State and County purchased the property.

[94] Memorandum from Jerry L. Schober, Superintendent, Jefferson National Expansion Memorial to Raymond L. Breun, Executive Director, Jefferson National Expansion Historical Association, 17 April, 1990. ULSG files. The fifth and final $50,000 note was paid May of 1994. The State of Missouri allocated money from a special revolving fund which is only used for loans to save properties, but must be paid back.

[95] State of Missouri, Department of Natural Resources and St. Louis County, Missouri to the United States of America, St. Louis County Recorder of Deeds, Book 8805, 729.

HISTORIC BUILDING CHRONOLOGY

Developing a time line of additions, modifications, and removals is important in the process of establishing an interpretive period, and ensuring accurate design recommendations. This is especially important at the Main House as there have been numerous alterations following Grant's ownership. This analysis is divided into seven primary renovation periods. Although the property had a history of ownership spanning several decades prior to construction of the Main House, this chronology focuses strictly on the house from its inception, and not on the property in general. Chronology information is derived from historic documentation and physical evidence. The reader is encouraged to refer to the specific analytical sections for details concerning chronology information. The written and graphic analysis will attempt to describe as accurately as possible the appearance and materials for each period.

PHASE I - 1817 to 1818

William Lindsay Long (1808-1818)

The initial construction of the two-story portion of the house occurred during William Lindsay Long ownership of the property between 1808 and 1818. However, while Long may have begun construction, he did not complete the house and may have never resided in it. In a letter dated January 28, 1818, from Anne Lucas Hunt to her father J.B.C. Lucas, she indicated some of the details concerning the Long House purchased by her husband:

> Mr. Hunt has bought W^{m} Long's farm on the gravois, which we intend removing to on the first of April-it is about 3 miles from Wilson O. Hunts mill, it has 50 acres of land, and in good fence 10 acres of which, is meadow, and a small crops of wheat, in the ground; a new frame house 36 feet, by 20, two stories high-galleries up and down in front, finished all but, the flooring, chimnies and plastering;...[96]

From her description, the house appears to have been uninhabitable as it apparently had no finished floors, walls, nor chimneys.[97] Long must have been sheltered in some other structure while work proceeded on his new house. Indications are that he and his family resided in a cabin along the Gravois River (see Historical Background and Context). However, from the footprint dimensions indicated in the letter, the extant two story section of the house is clearly the structure begun by

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[96] Anne Lucas Hunt, Letter to J.B.C. Hunt, 28 January, 1818, St. Louis, MHS, Lucas Collection.

[97] It is interesting to note that William Long's son, John F. Long, endorsed a print of the earliest graphic documentation for the house, dating about 1840, with the statement "White Haven, the House in Which and Where I was Born-August 29, 1816." According to the 1818 description of the house, there is little chance John Long was born in the house since it did not have floors, walls, or chimneys, and may in fact not have been built in 1816.

Long. Comparatively, the plan dimensions of the existing two story portion of the house is about 20 feet 4 inches by 36 feet 6 inches, or very close to the size mentioned by Anne Hunt.[98]

From a dendrochronology study initiated in 1987, an approximate year for the beginning of construction of the house can be estimated. The study found the felling date of three timbers to have been between Spring 1817 and Spring 1818.[99] The stone foundation was probably completed prior to the felling of the timber used for house construction. Hewers prefer green logs (especially oak) over cured logs as the wood is much easier to work. If the dendrochronology information is accurate, then it can be presumed that the foundation was begun no later than 1816 as time would have been required to quarry, shape, and set the stone. Therefore, the house was probably begun by Long no later than 1816; he completed at least the foundation, timber frame, siding, and roof. It is unknown if windows and doors were installed at that time as these prominent elements are not mentioned in Anne Lucas Hunt's letter. The interior finish work was completed, then, by the Hunts around 1818.

Long's plan layout for Main House, two rooms wide and one room deep, was carried to his third house in the area.[100] At the William Long Log House, located about 1½ miles from the historic site, the first floor plan is very similar to what the Main House must have appeared in size, layout, and fenestration.[101]

Existing physical evidence points toward the Long House[102] initially having had two front doors, each entering one of two ground floor rooms. The two door arrangement was typical for rural residences in the St. Louis region during the early part of the nineteenth century. Examination of studs, siding, and interior millwork along the south wall indicates that a substantial amount of work was performed to realign windows and doors (See Porch Analysis for specific information). Door D-1, now located in the Stone Building, may have served as one of those early front doors.

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[98] Coyle, 44. Coyle infers that the West Wing portion of the house was constructed in 1796 by "Jacques Mackay." Many other documents indicate that the house was begun by Long concurrent with his 1808 purchase of the property. Physical evidence (Phase III) shows that there is little chance that the West Wing was constructed prior to 1830, but was in fact moved and joined with the Long House. Considering that the structural history of the Main House had not been actively studied until acquisition of the house by St. Louis County, it is understood that dating of the house was at best based upon period construction technology and ownership duration.

[99] Richard Guyette, "White Haven Dating Report" (Columbia, Missouri: Forestry Department, November 16, 1987) in William Bodley Lane, "Final Report, White Haven Preservation Plan" (24 August, 1988), Attachment A (hereafter cited as Guyette, *Dating Report*). An 1817 felling year is listed for samples GRT002, GRT020, and GRT030 but Guyette notes that "felling dates represent the period during and after the growing season."

[100] Hamilton, "National Register of Historic Places Inventory - Nomination Form (William Long Log House)," Item 8, Page 2.

[101] Historic American Buildings Survey, "William Long Log House" (Washington D.C.: National Park Service, United States Dept. of the Interior, September, 1967), Sheet 2.

[102] The two-story portion of the Main House is hereafter referred to as the "Long House," principally constructed by William Lindsay Long.

There are extant and former examples of similarly styled houses in the St. Louis area having two front doors. The Zephaniah Sappington house, constructed near White Haven along Gravois Road, had a two story gallery, chimney construction, fenestration, and general appearance which was almost identical to how the Long House may have appeared. The Joseph Sappington house has the two door arrangement and massing similar to the Long House.

Windows 101-W3, 103-W1, 201-W1, and 203-W1 are original to the house. Windows at the gable ends served the attic space. The north elevation had five windows now occupied by Windows 106-W6, 202-W1, 203-W3, and 207-W1, and Door 103-D4. All windows, except at the attic, were of twelve over eight double hung sash glazed with cylinder glass.

The foundation and chimneys are constructed of rubble limestone laid in soil based mortar and pointed with sand/lime mortar. The stone was probably quarried at the creek bank just north of the house. The exterior mortar joints were raised to a point centered on the joint. The eastern half of the basement was crawlspace and the western half served as a soil floored root cellar and possibly as a kitchen (see Room Finish Survey, Rooms 102 and 103). It is unknown if the root cellar and crawlspace were separated by a limestone knee wall or if the floor level change was merely banked (see Room Finish Survey, Mechanical Room 002). It is suspected that a walk-down cellar entry was just south of the present center chimney stack.

The first floor had two rooms which may have served as parlors or possibly some other functions. Cooking functions probably took place in another structure or the basement as there is presently no fireplace suited for cooking in the Long House. The eastern parlor may have been the more formal space of the two rooms, while the west parlor was private, as the stair to the second floor bedrooms was accessed through that space.

The stairs were in the location of the existing Stair S-1, but the east wall of the stairwell was completely enclosed. Physical evidence suggests at this time that the walls were plastered and not wood paneled as exists at the principal stair at the Thomas Sappington house. The small room beneath the Main House Stair S-1 most likely served as storage space although it is unknown if a door was installed at the closet at that time.

The second floor was divided into two bedrooms. The east wall of Bedroom 203 was constructed with the house, but the west wall of Bedroom 201 may have been added soon after construction of the house.[103] The attic stair led directly into the attic space with no enclosure nor hatch. The attic was unfinished and may have served as supplementary bedrooms and/or storage.

All first and second floor spaces were finished with sand and lime plaster over hand-rived wood lath. Nearly all interior millwork was of yellow pine possibly sawn at a mill owned by Long's brothers-in-law.[104] The floors were constructed of mechanical-sawn and hand-planed tongue and groove boards. Interior decorative elements included the four chimney pieces (four of these remain in the structure), 6-inch moulded baseboards, chair rails, and beaded corner post, window, and door casings.

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[103] Stud framing in the east wall of Room 202 is vertical machine sawn whereas all other framing original to the Long House is hewn. See Phase IV, 1840 to 1868.

The interior doors were all six panel raised on a single side with applied moulding at the opposite side. Each door had a rim lock; the general type is unknown but suspected to have matched the lever rim lock now at Door 103-D2.

The paint analysis indicates that the exterior of the Long House was painted a cream color, if it was painted at all. This includes all windows, doors, and porches. Shutter color is unknown (see Shutters).

A general description of the two-story house begun by Long and completed by Hunt is as follows. The two-story house was constructed of red and white oak hand-hewn post and beam, and sided in hand-rived and planed white oak siding. The foundation and chimney stacks were constructed of locally-quarried limestone rubble set in dirt and lime mortar, and pointed in sand/lime mortar. The eastern half of the basement was crawlspace, the west half was a full basement for the storage of foodstuffs and/or possibly used as a kitchen. Access to the basement was through a short cellar door located at the southwest corner of the house. The principal architectural element on the building was, and continues to be, the two story gallery at the south elevation which was initially constructed with matching aligned first and second floor solid wooden posts. It is unknown if a porch existed at the north elevation prior to 1840. The roof was probably protected with wood shingles, although it is unknown if the shingles were sawn or shake, and of oak, cedar, or pine. The interior featured tongue and groove pine floors, plastered walls and ceilings, and four fireplaces. The house had nine over six style double-hung windows, and six raised-panel doors. There were two rooms on each floor; the second floor serviced by a stair enclosed by plastered walls.

PHASE II - 1818 to 1820

Theodore Hunt (1818-1820)

The Hunt family was to be responsible for completion of the house begun by Long, including installation of flooring, plaster finishes, and the chimneys. During their brief ownership of the property, they completed construction of a two-room addition at the north elevation. The addition is indicated on the earliest known illustration of the house (Figure 2.1). Although demolished in 1940, enough photographic documentation combined with salvaged millwork which came from the addition is available to describe the appearance and function of that addition.

A 1916 article indicates that the addition was constructed with elements that had the appearance of a ship's deck, including some type of oval structure on the roof, porthole windows, and a door and

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[104] KSL, *White Haven*, 21.

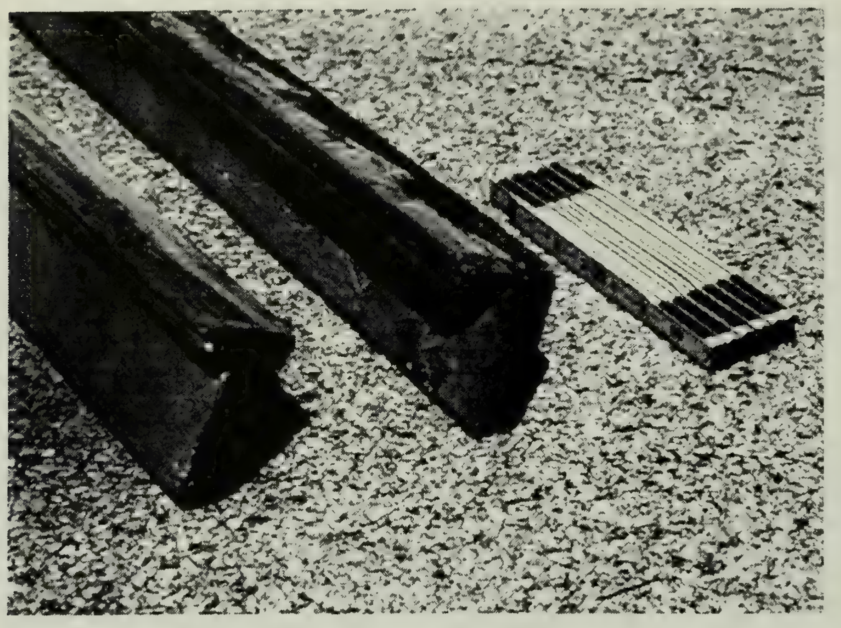

Figure 2.52 - Salvaged millwork from the historic Hunt Addition, 1994. These pieces were found in the Chicken House loft in 1992. On the left is a section of chair rail (ART-3). On the right is the north casing (ART-1) of the only door into the large Hunt Addition room. Note the paint lines at the top surface of the casing showing the exposure of the old siding. (Photograph by the author, ULSG collections).

window "...like they have on a ship."[105] According to Bill Wenzlick, his father is said to have uncovered remains of a railing at the perimeter of the roof when the top gable roof was removed. Unfortunately, there is no other physical nor documentary information to confirm either of these stories.

Nineteen-forty HABS drawings indicate that the addition measured approximately 14 feet 2 inch by 22 feet 5 inch overall in plan (although there is a 3 inch discrepancy between two stringer dimensions in the north/south direction). AutoCAD scanning and interpretation of 1940 HABS photographs indicate that the ceiling was about ten feet in height. The photographs also show that the foundation was constructed of limestone; if there was any crawlspace it was very shallow and probably inaccessible. The structure was of hand hewn braced frame construction with an initial slightly pitched flat roof which engaged the Long House just below the sill of Window 207-W1. Siding ran in continuous lengths indicating that it was machine sawn rather than hand rived as found on the Long House.

From 1940 HABS photographs taken during Wenzlick demolition work, the original lay of the Hunt Addition roof can be seen at the north elevation in what can best be described as a slightly gabled flat roof (Figures 2.28 and 2.37). The type of roofing is unknown but probably was sheet metal or painted canvas given the shallow, almost flat, pitch of the roof.[106] Careful examination of a 1940 HABS photograph taken during demolition of the addition indicates that the roof had two layers of wood deck (Figure 2.28). Boards 4 inches wide and about 1 inch thick can be seen in the image, laid over another layer of board sheathing. A wide frieze board with a deep cove moulding shapes the remainder of the cornice. The cornice projects about a total of 6 inches beyond the walls of the structure. It is doubtful that the first roof had gutters.

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[105] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 35. Mrs. John C. Dent (Anna Amanda Shurlds [JDG, *Memoirs*, 30]), the second wife of Julia Grant's eldest brother and assumed originator of these details, may have never have actually seen the Hunt Addition previous to the addition of the gable roof around 1840 since the article casts her birth date as 1834. Her association with White Haven at that time is dubious at best. The description of the Hunt Addition may have been passed down to her from Dent family elders or developed as local tradition.

[106] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 35. Described here as a "tin roof."

The addition featured two rooms, the largest of which may have functioned as a sitting or drawing room. The ten foot ceiling height and presence of a chair rail indicates that the room may have been a formal space.[107] The large room may have been used as a bedroom by the Dents and most certainly during Albert Wenzlick's period of ownership.[108] The function of the small room is unknown but may have served as storage for household goods, a butler's pantry, or as a wood closet in addition to protected passage between the Long House and the large room. A section of chair rail (Figure 2.52) discovered in the loft of Outbuilding B does not match chair rails in the Long House, but is very similar in appearance to a length of chair rail seen in place along the south wall of the large Hunt room in Figure 2.28. Length, construction marks, and nail patterns on the salvaged piece of millwork suggest that it may have come from the wall between the fireplace mantle and the northeast corner of the room.

Interior walls in the largest room were finished with plaster over hand split lath. Remnants of the finish system can be seen in a 1940 HABS photograph taken during demolition work (Figure 2.28). The original finish of the small room is unknown. Figure 2.30 shows that a sawn lath and plaster system was furred to the Long House siding on the south wall. That plaster system could have been installed anytime after about 1830 but most probably was installed by Albert Wenzlick during the room's conversion for use as a bathroom.

The function of the small room sandwiched between the Long House and the addition dining room is unknown, but suspected to have been a storage room for cord wood or household items. Nineteen-forty HABS drawings indicate that there were at least two, and probably three entries into the space. One door was off the porch, one from 1940 HABS Room 3 at what is now Window 101-W6, and one from the East Wing corridor.[109] It is unknown if the latter passage dates to the Hunt Addition construction or if this may have been added by the Wenzlicks when the small room was converted into a bathroom in the 1910s. However, that door is shown in a sketch plan prepared to show how the house was laid out prior to 1940 (see Lila Metcalf Wenzlick Sketch, Appendix I).

Photographic evidence suggests that there may have been an opening between the two Hunt Addition rooms. In the 1940 HABS photo (Figure 2.30) taken during demolition, the framing and baseboard are discontinuous between two studs at the south wall of the major room. In Figure 2.28 an opening above the chair rail can be seen through the wall prior to demolition of lath. It is unclear whether this opening was a door, window, or a pass-through and at what time period the opening may have occurred. However, if the opening served as a door it was at least 6 inches shorter than any other door in the addition.

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[107] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 36. The article intimates that the addition functioned as an apartment for Hunt, but the reliability of the article is in question.

[108] Marjorie Abbott Felice to William Bodley Lane, August 5, 1987, ULSG files, 1-2. Mrs. Felice relates a story of the "Dent boys" shooting holes into the ceiling while lying on the bed.

[109] Bill Wenzlick to the author, 8 December, 1994. The door between Room 101 and the small Hunt Addition room was not used in the 1920s and 1930s. The south face of the door was concealed by a large wardrobe.

Although the Hunt Addition had a small covered porch between the large room and the Long House, photographic evidence suggests that the west elevation had no porch when the addition was initially constructed. Nineteen-forty HABS photographs clearly show the existence of nail holes in studs that fastened siding to just below the roof line at the west elevation (Figure 2.29). Other ledger boards seen in this photo and in Figure 2.28 were probably installed to support a covered porch during Dent occupation. It is unknown if stone or wood steps or stoop serviced the covered porch and west entry for the addition.

The addition was covered with lap siding. Sections of siding found at the site are believed to have come from the Hunt Addition (Artifacts 72 and 73). The siding profile matches siding paint marks and the top coat color found on a piece of exterior door casing found elsewhere on the site (Artifact 1). The siding measures ⅝ inches by 6 inches and has vertical machine saw marks on the back side.[110]

The Hunt Addition was heated by a fireplace against the east wall of the large room. Unfortunately, there are no known interior photos of the fireplace. Because the footprint dimensions were too small to have been used for cooking, it is suspected that the fireplace was for heating only. In a HABS photograph (Figure 2.25) the chimney stack is shown as a composite of stone from the base to about the fireplace smoke chamber level, and brick from that level to the crown. Nineteen-forty HABS drawings indicate that the base was only 35 inches wide. Figure 2.25 confirms that the base was four bricks wide.[111] If the firebox was lined with a minimum of 8 inches of stone masonry, then the firebox had only a 19 inch wide opening. It is possible that coal fueled this fireplace as 19 inches is too narrow of an opening to stoke with wood.

It is speculated that the chimney stack was initially constructed entirely of stone and then rebuilt of brick sometime prior to 1890 (Figure 2.11). The chimney base was stone from grade to about the fireplace smoke chamber level (Figure 2.25). From the top of the stone base a brick stack rises into a corbeled crown. When compared to the heavy stone chimney stacks on the house, the Hunt Addition brick stack was quite ornate, leading to the supposition that the brick was a later addition.

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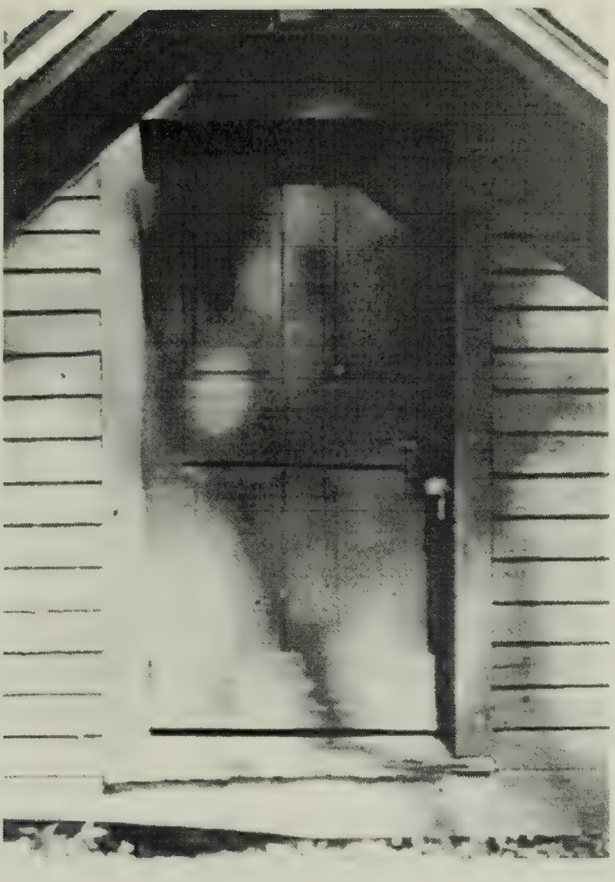
[110] Unfortunately, the top portion of the salvaged siding is missing. However, from the Artifact 1 paint marks it is believed that the Hunt Addition siding measured 6 inches wide and had an average lap of 5½ inches The siding also has the remains of a cut nail.

[111] Hearth bricks throughout the house were found to be 8½ inches by 4 inches by 2¼ inches. Four bricks laid in stretcher course would comfortably fill out a 35-inch wide course if three the head mortar joints measured about ⅜ inches wide.

Figure 2.53 - South Ice House door, 1994. Paint evidence suggests that this door was removed from the Hunt Addition and installed on the Ice House during the nineteenth century. The top panels were sawn off to fit the Ice House door opening. (Photograph by the author, ULSG collections).



A chimney piece shelf discovered in one of the outbuildings may have come from that fireplace.[112] Paint marks at the underside closely match the outside dimensions of the mantle legs indicated in the 1940 HABS drawings. However, the paint chronology of the shelf does not appear to complement colors on a salvaged chair rail and door believed to have come from this room. The chimney piece legs indicated in the 1940 HABS drawings had a wider clear opening than the exterior stone base. The chimney piece is also off-center with respect to the base in the HABS drawing. The reason for these discrepancies is unclear. Either the chimney base and firebox had been reduced in width, or the HABS drawings are incorrect. It is also possible that the chimney piece was salvaged from somewhere else and shoe horned around the fireplace opening.

There is no photographic evidence of the style of the door leading from the porch into the dining room. However, the door may have been similar to Long House doors. The north exterior casing (ART-1) of the door that was found in the Ice House verifies that the door was 79 inches in height (Figure 2.52). Its backband moulding profile is identical to original moulding found in the Long House. Paint chronologies compare favorably between the salvaged chair rail and the south door on the Ice House. The top two panels of the Ice House door have been removed to fit its present opening, but the style of the door matches that found throughout the Long House (Figure 2.53).

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[112] Artifact 30 was found in the Chicken House loft in 1992.

Therefore, the Ice House door may have come from a doorway in either the small or large rooms of the Hunt Addition.

There was at least one, and perhaps two, windows on the addition. One window at the north elevation is clearly shown in early Wenzlick and 1940 HABS photographs. It was similar in size and style when compared to the Long House windows. This window had shutters at least until 1913 (Figure 2.13). There may have been a window servicing the east elevation of the small Hunt Addition room. No window shows along the east elevation in the earliest illustration of the house (Figure 2.5) until 1872, when another illustration (Figure 2.5) shows a window in that location. However, there is no other nineteenth century documentation confirming Figure 2.5. A 1940 HABS photograph (Figure 2.30) shows an image of a hand hewn header between two studs in the location of that window. But the presence of uniformly spaced nail holes along the header length indicates that siding was nailed to the header at one time. Therefore, the header may have been cut from a stud and modified to serve as a header for the opening sometime after initial construction of the Hunt Addition. If there was a window in this opening at one time, it was replaced with a door by Albert Wenzlick for passage into the bathroom.

There is not enough information to suggest a floor material although it may have been similar to the Long House's tongue and groove boards. The floor level was about level with that of the first floor of the Long House.

The three pieces of salvaged millwork give a clue as to the colors the interior of the large room was painted. Paint analysis indicates that the salvaged chimney piece shelf was painted in successive color layers of dark brown (possibly stain or varnish), beige, dark green, and cream.[113] The salvaged chair rail is painted medium grey, cream, black, dark green, and two layers of cream.[114] The door found on the Ice House has only two colors on its interior side; cream and black.[115] The door and chair rail appear to compliment each other more closely than does the shelf. The door may have been moved to the Ice House around the time of the Civil War, when modifications were made to that building (see Ice House). The exterior of the Hunt Addition was probably painted the same cream color as the Long House.

Archeological excavations during 1991 failed to locate the northwest corner of the foundation, nor any substantive evidence of the fireplace. No visible foundation remains can be seen within the existing breezeway crawlspace. It is possible that the historic foundations were removed as a result of 1940 demolition and later construction activities by the Wenzlick family.

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[113] WUTA, sample P-ART30-551. Turquoise was detected on the last coat. However, it was determined that the turquoise was present as a result of the shelf being stored in long-term contact with another piece of millwork.

[114] WUTA, sample P-ART3-595.

[115] WUTA, sample PN-549.

There is no other evidence that the Hunts were involved in other major modification work. It is improbable that they had time enough to renovate other portions of the house given their brief period of ownership.

PHASE III - 1820 to 1840

Frederick Dent - 1820-1865

West Wing
Rear Porch
Hunt Addition Roof
Front Entry, Hall, Stair, and Porch Modifications

"On June 22, 1820, Frederick Dent purchased 184 arpents of the Gravois farm from Theodore and Anne Lucas Hunt for $6000."[116] The one-year note was paid and the Dents owned the place on February 19, 1821. The first substantial improvements made by the Dents included the addition of the West Wing, rear porch, and Hunt Addition porch and gable roof. It is believed that all of these changes took place before 1846 when Frederick Dent attempted to sell White Haven, advertising that the house as containing nine rooms.[117] At no time previous to the Dent improvements did the house contain nine or more habitable rooms, but it is questionable as to what was considered a room at that time.[118]

Dent took out a $5,000 mortgage on White Haven in 1843, but the mortgage may have been secured to purchase other land rather than renovate the house.[119] However, the earliest graphic documentation of the house shows the West Wing in place by around 1840 (Figure 2.1). Why the Dents chose to enlarge their house is speculative, but by 1843 the Dents had seven children ranging in ages between seven and twenty-seven, all of whom brought friends home from school to visit on weekends and vacations.[120] Perhaps the family needed the extra space for their maturing family and their guests. The last of seven living Dent children, Emily, was born in 1836. The crowded conditions in the five- room Long House may have given Dent incentive to expand his house.[121]

Substantial renovation also took place on the front porch, first floor room layouts and circulation routes, front door and windows, and the stair to the second floor. This renovation work may or may

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[116] KSL, *White Haven*, 37. "The Arpent is a colonial French measurement of area equivalent to 0.8506 acres." KSL, *White Haven*, 10.

[117] "Improved and Unimproved Land for Sale," *Missouri Republican*, 5 August, 1846.

[118] See Phase IV, 1840 to 1868 for further discussion.

[119] KSL, *White Haven*, 40-41.

[120] KSL, *White Haven*, 39.

[121] *JDG, Memoirs*, 30.

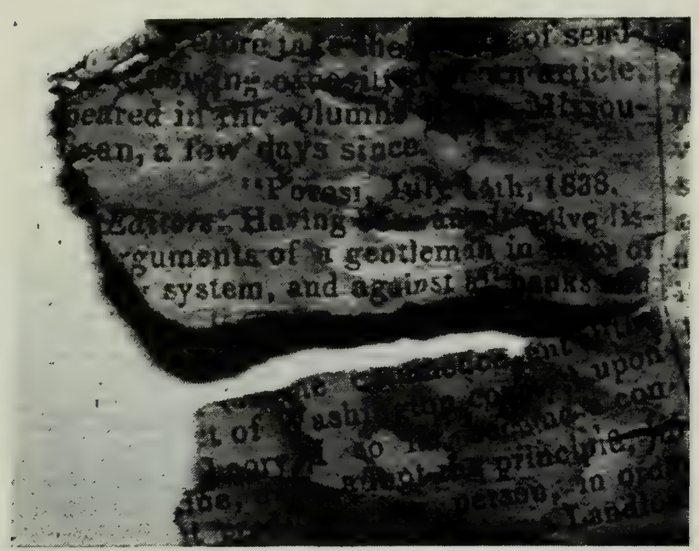

Figure 2.54 - Newspaper fragment found encased in plaster in a West Wing wall cavity. The date line indicates that the West Wing could not have been plastered until after July 1838. It is believed that the fragment is from an edition of the *Missouri Argus*. (Photograph by the author, fragment in ULSG collections).

not have taken place during construction of the aforementioned additions, but physical evidence indicates that these renovations certainly were completed by 1846.

According to the results of a dendrochronology study prepared in 1987, the West Wing timbers were felled between 1832 and 1835.[122] This contradicts local stories that the West Wing predated Long's occupation of the site which were based solely upon the addition's construction technology.[123] The detailing of the vertical logs to the foundation sill also suggests that the structure was built late during the French Colonial style period.[124] If this is the case, then the West Wing was built with much hand labor at a period when sawn lumber would have been readily available.

Another piece of dating evidence was found during an investigation of a vertical log wall cavity at the north interior wall of the West Wing. A section of newspaper bearing the date July 14, 1838 was found partially encased within a blob of sand/lime plaster at the base of the wall cavity (Figure 2.54). It is believed that the plaster dropped into the cavity when the first plaster finish was applied to the wall.[125] Therefore, the West Wing could not have been plastered prior to July 14, 1838.

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[122] Guyette, *Dating Report*.

[123] Esley Hamilton, "National Register of Historic Places Inventory - Nomination Form (White Haven landmark nomination)" (Washington D.C.: U.S. Department of the Interior, October 1985). Statement of Significance.

[124] Jack Luer to the author, 14 October, 1992. Architect Luer has studied many if not all of the French Colonial vertical log structures in the Upper Mississippi Valley. According to Jack Luer, the detailing on the West Wing is unusual in comparison with the structures he is familiar with, and he feels that the West Wing was constructed late in the French Colonial era.

[125] Age identifying entries on the newspaper read "Potosi, July 14, 1838," in reference to letter to the editor, and "BY THE PRESIDENT OF THE UNITED STATES. In pursuance of law, I, Martin Van Buren..." in reference to land transactions. The land transaction entry appeared in at least four issues of the weekly Argus from August to September 1838. Unfortunately, the precise issue that the letter to the editor occurred is not known because of gaps in archive collections of this newspaper. However, it is thought that the plastering could not have taken place until after July 1838.

Existing physical evidence confirms that the West Wing was added to the Long House and was not the first structure on the site as contended by local tradition.[126] Original painted siding on the west elevation of the original two story portion of the house can been seen within the east wall cavity of Closet 104B and Attic 205 (Figure 2.55), and original siding and the skirt boards can be seen from the basement. The single weathered beige paint coating on this cladding suggests that the West Wing was added after construction of the Long House.

The central chimney stack still retains much of its original raised sand/lime mortar pointing within basement Room 003, behind the east wall of Room 104, and within Attic 205. This pointing method was usually reserved for exterior applications but is now concealed and protected by West Wing construction.

Physical evidence suggests that the West Wing was moved as a whole and joined to the Long House, and not constructed in place piece by piece. The West Wing vertical log walls include the entire exterior perimeter of the West Wing and the east wall of Room 104. The log structure apparently was salvaged from a two-room cabin probably located not too distant from White Haven, although the exact location and reason for its selection is unknown. Relocation of structures was prevalent during the eighteenth and early nineteenth centuries as it was easier to move a building than to construct one anew.[127] All of the wall and first floor structural members are hand hewn. Ceiling joists are, for the most part, pit sawn and hand hewn.

Examination of east end of the West Wing which engages the Long House indicates that structural members, cornice trim, and roof sheathing had been cut completely through to separate the two portions of the salvaged cabin (Figure 2.55). Joists at the first and attic floors had also been modified or removed to fit around the central chimney stack.

One curiosity of the West Wing is that its first floor level was constructed about 8 inches above the Long House floor level. Why the builders decided upon this condition is unknown. Perhaps the Dents strived to provide adequate head room in the cellar winter kitchen. Or maybe the builders misunderstood the relationship between the new foundation and West Wing foundation sill detailing prior to joining the structure to the Long House. In any event, all first floor rooms and porches were constructed at the same level except for the West Wing.[128]

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[126] Elinor Martineau Coyle, *Old Saint Louis Homes, 1790-1865* (Saint Louis: The Folkestone Press, 1964), 44, Mary Barrett, "House With a Proud Pedigree," Globe-Democrat Magazine, 30 September, 1956, n.p. (first page of story), and William Bodley Lane, "Final Report, White Haven Preservation Plan," (August 24, 1988), 5. Coyle and Barrett state that James Mackay built the West Wing in 1796, and between 1796 and 1808 respectively. The confusion is understandable given that the house had never been carefully evaluated prior to 1987. The first known documentation of the theory that the West Wing was moved and joined to the Long House is raised in Barrett's 1956 article. Barrett's article states that "There are no records of this move, and it is impossible to tell just when the move took place." The source for her information is unknown; the bulk of the article is peppered with inconsistencies and errors, however. Lane indicates that the West Wing was added to the house and may have been moved from some other site.

[127] John Obed Curtis, *Moving Historic Buildings* (Washington: U.S. Dept. of the Interior, 1979), 1.

[128] Bill Wenzlick to the author, 30 November, 1992. Bill Wenzlick could recall no level changes between any of the first floor spaces and porches prior to 1940 except at the West Wing.

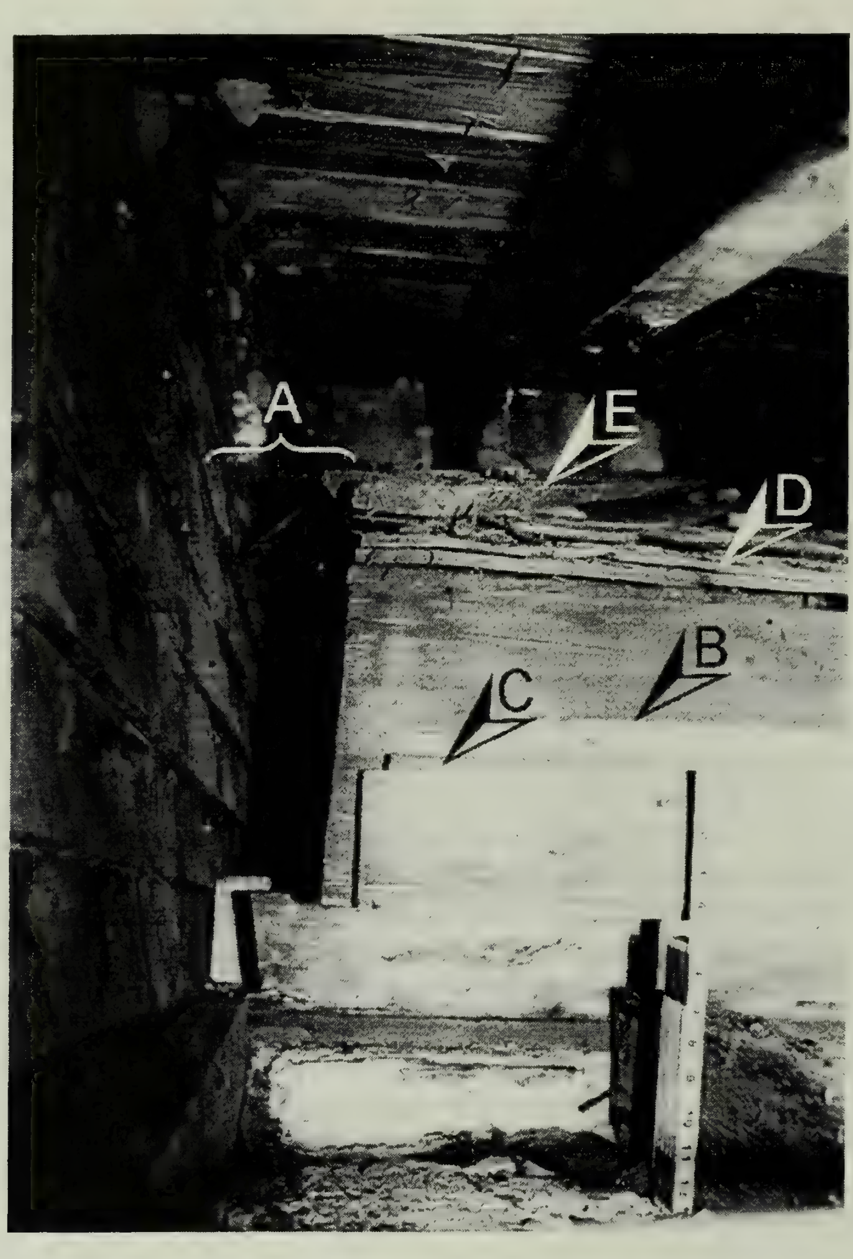

Figure 2.55 - Intersection between the West Wing north cornice and Long House siding, 1992. This photograph was taken within the Room 107 attic space looking south. The four inch gap (**A**) between the Long House siding at right and the West Wing cornice is physical evidence that the West Wing was joined to, and not constructed integral with, the Long House. The gap was flashed with a coped board found laying loose on top of the roof at (**E**)(see also Figures 2.56 and 2.88). The hand rived siding at left has been concealed since prior to 1875. The paint line at (**B**) shows that the length of cornice trim (**C**) was moved down around 1940 for use as a structural ledger board for Room 106 ceiling joists. Wood shingles original to the West Wing yet remain in the cavity formed between the old West Wing roof (**D**) and the roof above installed prior to 1860. (Photograph by the author, ULSG collections).

If the dendrochronology study results, Figure 2.1, and the age of the plaster encased newspaper are collectively considered, then the West Wing was added to the Long House between 1835 and 1840.[129] It is possible that the structure was in an unfinished state when Dent moved it up and joined to the Long House, and the interior plastered sometime between 1838 and 1840.

In summary, from the available evidence it appears that the West Wing was constructed as an individual cabin with two or more rooms, on or near White Haven property. Sometime between 1835 and 1840 a section of that cabin was separated, moved, and joined to the Long House, possibly to add space to the house of a growing family. The building from which the West Wing was salvaged could not have been standing more than five years until it was salvaged for use at White Haven.

The rear porch, Hunt Addition gabled roof, and the Hunt Addition porch are believed to have been constructed at the same time or soon after the West Wing was added. While the earliest documentary evidence for the Hunt porch occurs in an 1875 lithograph (Figure 2.6), through examination of photographs enough physical evidence remained into the twentieth century to describe the sequence of porch construction at the back of the house.
Early Wenzlick and 1940 HABS photographs indicate that the North and Hunt Addition Porches were constructed at the same time. A portion of the Hunt porch ceiling extended completely beneath the early covered porch (Figure 2.28). The top surface of the later porch's ceiling joists had no sheathing indicating that the ceiling had always been sloped and not been an earlier roof. Examination of Figure 2.28 indicates that the second porch on the Hunt Addition was added after construction of the Hunt Addition as siding nail holes can be seen in the studs formerly concealed by the porch roof indicating that siding original to the Hunt Addition had been removed to install the porch roof.

The second roof over the Hunt Addition must have been constructed integral with the rear porch and second porch roof on the Hunt Addition. The west leaf of that roof served to protect the Addition and the second porch on the Hunt Addition. The reason for construction of the gable roof over the first shallow Hunt Addition roof may have been to provide a more weather-tight enclosure.[130]

Photographic evidence supports the theory that the rear porch and Hunt Addition porch were added at the same time that substantial modifications were made to the front porch. Careful examination of a 1913 photograph of the north elevation (Figure 2.13) shows the posts of the North and Hunt Addition porches to be nearly identical in appearance to the south porch posts at the first floor, although design detailing is more informal and restrained. More is discussed on this point below on the front porch analysis.

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129. KSL, *White Haven*, 40. A nationwide economic panic that lasted for six years began in 1837. As Little notes Frederick Dent frequently ventured in real estate, and was the first to feel the effects of national economic decline.

130. "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 35. The article simply describes the original Hunt roof as "unsatisfactory."

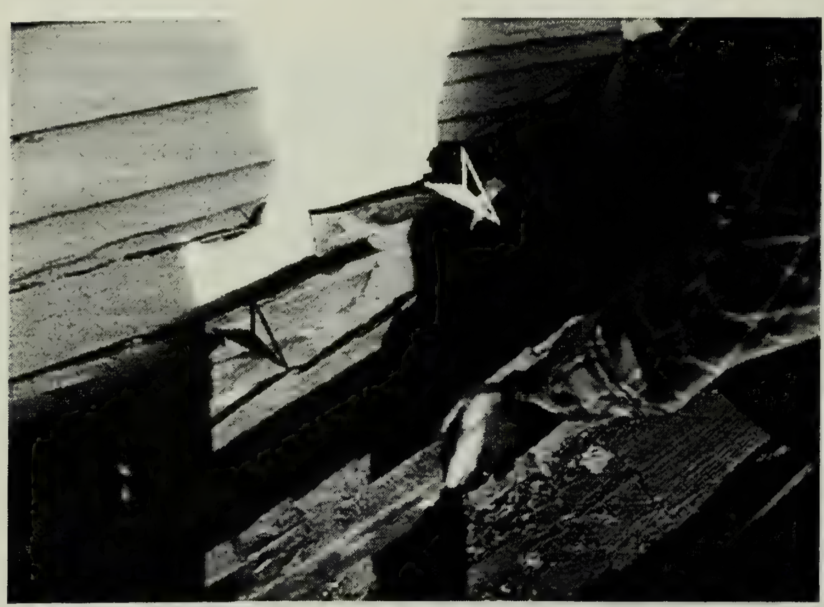


Figure 2.56 - Flashing board at the intersection between the old West Wing roof and the Long House siding, 1993. The board was found loose within the cavity formed between the old roof and the roof installed prior to 1860. Beveled and coped notches (see arrows) in the top end of the board fit precisely beneath the Long House siding to channel rain onto the West Wing roof. The bottom edge of the board is beveled to rest flush on the wood shingles. (Photograph by Laura Johnson, ULSG collections)

If the rear porch was constructed at the same time as the West Wing, the porch may have ended at, or near, the northwest corner of the Long House. Wood shingles on the old north roof leaf of the West Wing are moderately weathered indicating long-term exposure to the elements. If the old roof had been covered with the rear porch roof by 1840, less erosion of the shingles would be expected. During 1993 roof work a flashing board was discovered laying loose on the old West Wing roof (Figure 2.56). The board is expertly coped to fit the Long House siding and cant against the top of the old West Wing roof shingles. This indicates that the old West Wing north roof was entirely exposed for a time.

Realignment of the south elevation first floor porch posts may have occurred during early renovation work by the Dents. The addition of the wall dividing Stair Hall 102 from Living Room 101 required realignment of the front entry in relationship to porch posts, or perhaps the replacement of the original front door with the existing broader entry dictated a reassessment of front porch circulation.

A plausible argument is that each of the two rooms in the original first floor plan had a front porch entrance. Given the even number of porch bays, this may be the more logical solution as a single entry forces an asymmetrically aligned entrance against a symmetrically designed facade. Existing physical evidence at the first floor south elevation suggests that realignment of the original siding and skirt boards beneath the window sills has taken place (Figures 2.57 and 2.58). Two nearly continuous butt joint lines in the siding and skirt board occur 8 feet 3 inches in from the southeast and southwest corners of the Long House. At the south interior elevations of Rooms 101 and 103, butt joints in the original chair rails are also 8 feet 3 inches measured from the same exterior corners of the house. (See Interior Elevation drawings). Additionally, the chair rail joint in Room 103 is separated by a distance of 3 feet 10 inches from another chair rail joint nearly aligned with the east

Figure 2.57 - Exterior siding beneath Long House Window 101-W2, 1994. A uniform butt joint at the siding and skirt board (**A**) gives evidence or a previous door opening at this location. Two aligned siding butt joints (**B**) probably indicate the west edge of the original door opening. There are similar joints beneath Window 103-W2. (Photograph by the author, ULSG collections).

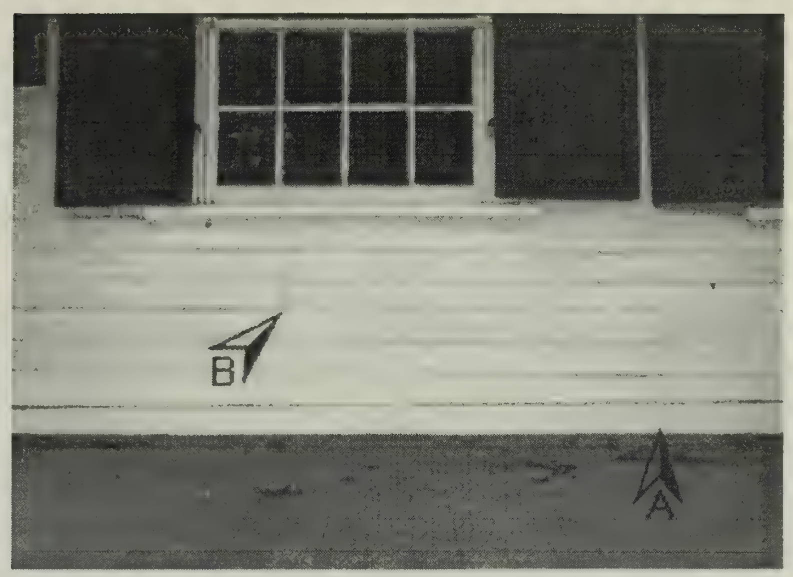
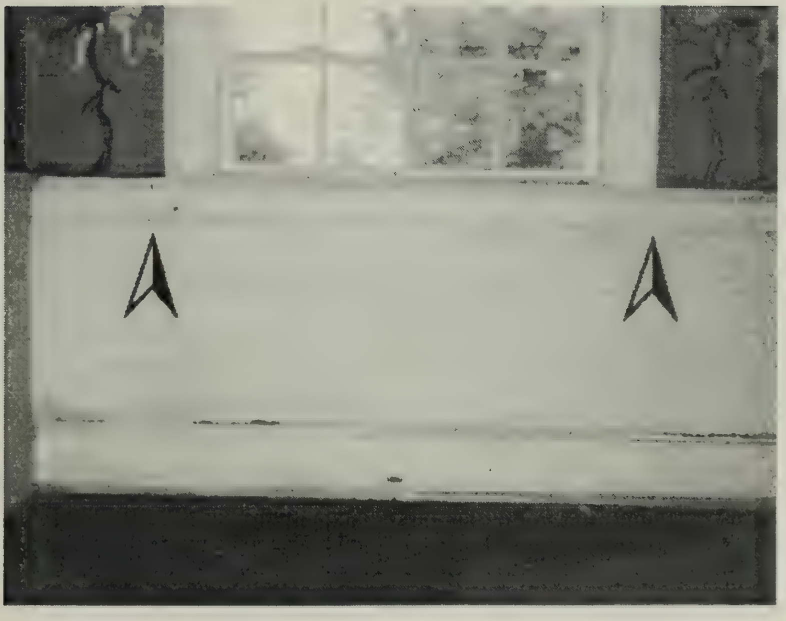


Figure 2.58 - Chair rail butt joints beneath Window 103-W2, 1994. These two joints (at arrows) indicate the location of a former door opening. It is believed that the section of chair rail was installed to infill the opening when the window was installed. This condition does not exist at the interior of Window 101-W2 however. (Photograph by the author, ULSG collections).



casing edge of Window 103-W2, wide enough for a 3 foot wide door with casings. Further, the location of these two theoretical entries would be centered exactly on each of the two smallest bays in the second floor porch.[131]

A nine panel door salvaged by the Wenzlicks for use on the Stone Building may have served as one of the former front doors (See Stone Building, Door and Window Openings). Its 36-inch width combined with the casing widths to each side of the installed door measures 3 feet 10 inches, the exact measurement found in siding and chair rail butt joints at the south wall.

Documentation of physical evidence indicates that stud framing was substantially altered in the south wall of Living Room 101, possibly to accommodate placement of Window 101-W2. The use of cut spikes suggests that these alterations occurred early during Dent occupation but the exact date is unknown.

A structural beam was discovered in the ceiling of the central hall (See Structural Plans, Second Floor). The north end of the beam is, in part, supported by a heavy post at the north end of the hall. However, the south end rests directly above the front door transom, which gives an explanation for the slight deflection of the ceiling in that area. A post may have been removed from the area now occupied by the door. Evidence for the post may be found if the threshold is removed during restoration work. Examination of the floor area in an interior 1940 HABS photograph of the hall indicates that a wall dividing the two Long House first floor rooms was extant prior to installation of the existing front door (Figure 2.32). That wall was removed at the same time that Stair S-1 was opened at the east wall (See Stair Analysis).

If this theory is accepted based upon existing physical evidence, then the chain of events for the former nineteenth century owners to realign the first floor porch posts is as follows (refer to Historic Building Chronology Drawings):

1. The Dents decided to subdivide the east parlor into two spaces creating a central entry/stair hall. The reason for that decision may have been to provide a more formal first floor, or revise circulation patterns when other room additions were constructed.

2. Upon creation of Hall 102, a single formal entry into the building replaced the two-door entry. The two exterior doors were removed and replaced with windows, and the existing Greek Revival door with flanking lights and transom were installed.

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131. William Bodley Lane, "Interim Report, White Haven Preservation Plan" 25 September, 1987, 3. Lane investigated and briefly reported on the removal of two first floor post. He found mortises in the underside of the hewn second floor level beam, and postulated that the historic boxed posts concealed original solid posts prior to 1840. However, the mortises could have been chiseled at the time the posts were moved by the Dents.

3. The voids left by the two removed doors were infilled with siding, skirt boards, and chair rails salvaged from the installation of the central door.

4. Finding that the first floor porch posts hindered views from the new windows, and more importantly created a circulation impediment to the new front door, the Dents relocated the posts to between the windows and new door. The first floor porch posts were centered between the now asymmetrically located windows and doors. This realignment caused dissimilar spacing between the posts.

The existing interior baseboards cannot be relied upon for evidence of the two exterior doors as the Wenzlicks removed and may have replaced them when they raised floor levels. Likewise, the chair rails in Rooms 101 and 103 and the skirt boards at the front porch level may have also been affected by the Wenzlicks in some way during their renovation work. However, the alignment of the chair rails, siding, and skirt boards is too obvious to be coincidental. During future work on the house physical evidence supporting or disproving the two door theory should be sought. The areas to look at include wear marks in the original flooring now concealed by a raised floor, and displacement or reinforcement of wall framing around the location for the two doors if wall finishes are removed.

Although there is no documentary evidence, it is assumed that the first floor porch and room renovation work coincided with the West Wing and rear porch expansion work. The similarity in design characteristics between the boxed posts on the front and back porches supports this supposition. Figure 2.13 shows very wide boxed posts with moulded capitols and plain board plinths on the back porch. These are very similar to those found on the front porch. However, back porch posts have no fluting and capital necking as found on the front porch posts. The difference in detailing may have been a formal versus informal consideration. In any event the similarity of post detailing signifies that all of the porches may have been constructed by the same builder. However, the possibility must be acknowledged that details could have been copied from either set of porch posts in later construction of the other.

The Hunts or the Dents may have been responsible for the addition of the second floor partition dividing existing Bedroom 201 from Stair Hall 202. The wall studs are vertical machine sawn rather than pit sawn or hewn as the rest of the early framing in the house. Yet the extant lath at the hall side is hand-rived. In comparison, the first floor partition directly beneath that wall, believed to have been installed around 1840, is constructed of machine-sawn framing and lath. The second floor wall could have been an early Dent modification to provide more privacy for their large family prior to the extensive renovation work they performed around 1840.

The chimney piece in Room 101, installed during Long/Hunt occupation, may have been replaced with a Greek Revival chimney piece by this Phase. The replacement chimney piece can by seen in a 1940 HABS photograph (Figure 2.33), and a measured drawing prepared after the millwork was removed (Appendix I, Living Room Chimney Piece). It is postulated that the chimney piece now in West Wing Room 104 was removed from Room 101 during Dent ownership, and transferred to

Room 104. The Greek Revival chimney piece was then installed in the more public space, Room 101. The Greek Revival chimney piece was removed during 1940 renovation work and subsequently destroyed (see Fireplaces and Chimney Pieces, Fireplaces FP2 and FP4).

Paint evidence suggests that the house, including windows, doors, trim, and porch millwork were primarily painted in a cream color. It is possible that the house was first painted when the work of this period was completed as paint evidence suggests only one coat of the cream color.

In summary, the West Wing, rear porch, and Hunt Addition gabled roof were added to the house at the same time, perhaps in response to an expanding Dent family. The West Wing is a portion of a late French Colonial style cabin that was relocated from near White Haven and joined to the Long House structure. At about the same time interior modifications were made to the Long House to create a central stair hall (102) at the first floor and possibly at the second floor, and modify the front entry and first floor porch post arrangement. While the West Wing basement and first floor rooms are virtually intact today, the rear porch area was extensively modified and the Hunt Addition removed in 1940.

PHASE IV - 1840 to 1868
Frederick Dent - 1820-1865
Ulysses S. Grant - 1865-1885
East Wing
Rear Porch Roof Extension

The only substantial addition to the Main House between 1846 and 1868 was the construction of a curious, single floor wing off the east elevation of the Hunt Addition. The date of construction of the now demolished East Wing is unknown, but the wing was extant by 1868 as shown in an engraving of the house (Figure 2.4).

In 1846 Dent attempted, but failed, to sell his farm on the Gravois when he advertised a dwelling containing nine rooms.[132] By comparing the nine room count with the circa 1860 photograph of the house (Figure 2.3), the following rooms were probably in existence at the time of the 1846 sale:

Existing West Wing winter kitchen (003)
Existing Living Room (101)
Existing Dining Room (102)
Existing West Wing Bedroom (104)
Existing Bedroom (201)
Existing Bedroom (202)
Large Hunt Addition room

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[132] "Improved and Unimproved Land for Sale," 1846.

Small Hunt Addition room
East Wing room

Since the Dents remained in financial trouble between 1843 and 1850 as a result of an economic depression and disputed land titles, they may not have had the ability to pay for improvements at White Haven during that period.[133] It is doubtful that any improvements were made to the house from 1857 when Frederick Dent's wife, Ellen, died, through the Civil War years when Frederick became ill. The absence of evidence for a chimney or other heating apparatus suggests that the East Wing may have been principally occupied during warm weather (Figure 2.11).[134] It is possible that the wing was constructed as a bedroom for the elder Dent children who returned from college during the summer months, or as a guest room.[135] If this is so, the wing may have been added soon after 1840 since the Dent children were grown by the 1850s. A guest house, or garçonnière, was frequently found with stately southern mansions, although typically constructed separate from the owner's principal house.[136] That tradition could have been carried to the Main House but at a more modest level.

One theory has been suggested that the East Wing was constructed for Ulysses Grant's farmhands working the fields during the summer months. Grant ordered work to proceed on expanding the Main House to provide more space for hired farm hands, but he did not issue that order until late 1870, or over two years after the first documented appearance of the East Wing.[137]

Because the East Wing is no longer extant, all analysis must be derived from photographic and 1940 HABS documentation, and any surviving archeological evidence. Exterior elevation drawings were developed by scanning available photographs to AutoCAD and using reverse perspective techniques to derive vertical measurements. The 1940 HABS drawings were used to plot most plan measurements.

The East Wing appears to have been physically attached to the Hunt Addition, but there apparently was no doorway directly between the two additions until the twentieth century. In a traditional sense garçonnière describes how the East Wing may have been used. A single source suggests that the small room quartered a country doctor's office.[138]

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[133] KSL, *White Haven*, 40-43.

[134] James and Charles A. Davis to the author, 18 March, 1993. They described the East Wing as "just a bedroom" during the 1920s through the 1930s, and that the room was "very plain" with no heating apparatus.

[135] JDG, *Memoirs*, 44. The Dents, especially the school age children, frequently had guests overnight at the house.

[136] Frazer J. Smith, *White Pillars: Early Life and Architecture of the Lower Mississippi Valley Country* (New York: Bramhall House, 1941), 100, 201, and 251; and Jay Edwards, Copy of draft lexicon titled "French terms employed in this volume, particularly those relating to construction technology," (January 1987), 7. The definitions offered by each of the authors are similar. Smith defines the term as "An outbuilding used as the son's quarters on a plantation; also for unimportant, or overflow guests." Edwards submits "In Louisiana: "Young men's bedroom," either in the loft (grenier) of a house, or in a dependency building, set apart from the main house."

[137] USG, *Papers*, 17:28, USG Letter to WE, 18 January, 1867. "There are also about one dozen log cabins on the place which I have directed to be torn down as soon as you go out [to White Haven]. One or two of them can be moved up and put up so as to give you additional room. They have windows, door, floors &c. so that you would take but a short time, with help, to make you quite comfortable."

The earliest graphic documentation that this wing appears is in an engraving published in 1868 (Figure 2.4). In that photo the East Wing is virtually featureless save for a single window at the south elevation and a gable roof. In an engraving published in 1872 much more detail is shown but there are some unusual features attributed to "artistic license" (Figure 2.5). In that illustration the East Wing is detached from the Hunt Addition. There is no indication that the gable roof nor the south wall joined the Hunt Addition, and that there was perhaps a passage between the two structures open to the exterior at each end and above.

There is no evidence in later photographs that the chimney rendered in Figure 2.5 at the west end of the roof ever existed in that location. The artist may have placed the Hunt Addition chimney on the East Wing ridge when in fact it should have appeared in the background. An 1890 photograph clearly shows how the chimney could have been transposed (Figure 2.11) from the Hunt Addition to the East Wing roof. In fact, there is no evidence that the East Wing ever had a chimney.[139] Another curiosity is the depiction of a roof hatch adjacent to the chimney. It is unknown why a low and shallow roof such as this would have required access from the attic. However, the broad eaves and rake with decorative fascia, horizontal siding, and single window all agree with later photographs.

The earliest known photographic image of the East Wing was taken in 1890 (Figure 2.11). Clearly, the wood shingled roof is engaged to the Hunt Addition roof and east exterior elevation. Twenty-one shingle exposures can be counted at the south roof; the ridge is capped with a one- inch thick board. There is a hall open at the south elevation between the Hunt and East Wing structures as the Hunt Addition siding can be seen to continue into the hall. The horizontal siding appears in continuous lengths but is irregularly spaced in the section below the window. The skirt board is almost in contact with the grade and is painted in a darker shade than the siding. The six over six double hung window is like no other style in comparison with other windows in the house. The head casing is slightly pitched to each side and the lower half of the window may have had a screen at that time. There is no indication that shutters ever existed on that window. The roof had a ridge board, and the saw-tooth fascia confirms the image which appears in the 1872 lithograph.

A photograph taken around 1928 is the only documentation of the appearance of the east and north elevations of the East Wing (Figure 2.23). In that photo a window at the north elevation appears similar in style to the south elevation seen in the 1890 photo, but there are no exterior head nor jamb casings. There is also a door adjacent to the Hunt Addition which features an exterior screen door.

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[138] Marjorie Abbott Felice to William Bodley Lane, 5 August, 1987, ULSG files, 1. Mrs. Abbott speculates that the shed next to the cow barn in Figure 2.6 East Wing may have been moved and joined to the Hunt Addition. However, the East Wing is seen in illustrations that predate Figure 2.6 by at least seven years.

[139] Marjorie Abbott Felice to William Bodley Lane, 1. In her letter Mrs. Felice was confused by the appearance of a chimney in East Wing shown in the 1872 illustration (Figure 2.5), but she writes that the room did not have a fireplace.

However, a butt joint line in the siding above the east casing of that door gives evidence that the door may have been added to seal off the open hall seen in the 1890 Figure 2.11 photograph. In Figure 2.23 there are twenty-one wood shingle exposures with a ridge board at the north roof. This matches the south roof shingle exposure and ridge condition seen in Figure 2.11.

The last photograph of the East Wing prior to its complete removal was taken during 1940 demolition work. In Figure 2.25 the East Wing was clearly of light wood frame construction. Regularly spaced plaster stains on the studs also indicate the use of sawn wood lath for interior finishes. Perhaps the most revealing piece of evidence in this photo is the existence of board sheathing at the east side of the East Wing hall. The sheathing is fastened to studs which are notched to receive the rafters, a construction detail more indicative of exterior end-wall rather than interior partition construction. This indicates that the East Wing may indeed have been separated from the Hunt Addition at one time as seen in the 1872 illustration (Figure 2.5), then the roof later engaged to the Hunt Addition to form a covered passage between the two structures as seen in the 1890 photograph (Figure 2.11). The evidence for this scenario is weak at best, and the East Wing may have always been constructed with a roof engaged to the Hunt Addition. However, the East Wing may have originated as a one room cabin that was moved and joined to the house, much like the West Wing.

Archeological excavations commenced during 1991 to intersect evidence of foundation lines from which corners could be extrapolated. Unfortunately, no clear sign of a foundation was found suggesting that the foundations were totally removed, or the possibility that the East Wing was supported by piers.

To summarize, the East Wing was initially built of light wood frame construction and sheathed in machine-sawn siding possibly underlain by board sheathing. The foundation material is unknown but suspected to have been shallow rubble stone walls or piers. The shallow pitched gable roof was protected by wood shingles with a ridge board cap, and the eaves and rake accented with a saw-tooth fascia. The south elevation had at least one six over six pane double hung window with a subtle, pedimented head casing. The north elevation had a window of similar style but without casing. The structure may have been initially constructed detached from the Hunt Addition with a narrow passage open to the elements between the two structures. The interior finishes were probably of plaster over sawn wood lath as seen in a photograph taken during demolition (Figure 2.25). Floor finishes are unknown but suspected to have been tongue and groove wood strip flooring.

The earliest photograph yet found of the Main House shows how it appeared during the Civil War (Figure 2.3). In the circa 1860 view it is clearly seen that the rear porch roof extended over the north roof of the West Wing. The space beneath the roof was completely open. Curiously, there was no raised porch deck north of the West Wing, but there appears to have been a finished surface such as plank or brick laid directly on the ground. The roof was supported by two slender posts, measuring about 4 inches square, supported directly on the ground. There was no lowered ceiling. The west gable end space between the West Wing roof and the rear porch roof appears to be completely open in the photograph. This section of the rear porch roof may have been nothing more than a simply constructed wooden canopy. Figure 2.3 also shows what appears to be a hand operated washing machine beneath the roof extension. This indicates that the roof may have been constructed to provide shelter for household chores.

In Figure 2.3 there is a very faint image of the western edge of a raised porch deck beyond the roof canopy. This is the rear porch deck which extended at least to the northwest corner of the Long House. It is unknown if there were steps at the service door (108A-D1) or if the porch deck extended west to include the door. No physical evidence has yet been found to determine the extent of the porch ceiling finishes. No stairs can be seen servicing the north West Wing exterior door (104-D3) if it indeed existed at that time.

Other details are gleaned from Figure 2.3. The West Wing roof had a combed wood shingle ridge. The intersection of the West Wing rake and eave line at the southwest corner appears to have been capped with a wide board. The corner trim terminated at the lower cap edge. Appearance of narrow West Wing rake trim confirms the authenticity of a piece of moulded 1 inch by 4 inch trim found at the gable end during 1993 roof work. The squat cellar entry door cannot be seen. In its place is a series of eight horizontal slats, evenly spaced from head to sill. It is unclear if the slats were some kind of barrier to animals while allowing air movement to the cellar kitchen, or if the doorway had been boarded up. However, if the intent had been to board up the cellar door, the use of wide boards would be expected.

Paint evidence suggests that exterior siding and trim continued to be finished in a cream color into the 1860s. However, shutters, front doors, porch posts and railings, and fascia boards and trim may have been painted brown by this time. In a recollection prepared by Emma Dent Casey, Julia Grant's sister, she states that the house was painted white.[140] The "white" she describes may be a cream or light beige color detected as the first finish applied to the exterior of the house. One physical clue occurs at original West Wing siding which lies beneath siding installed when Room 4, identified in the 1940 HABS drawings, was constructed prior to 1875 (see Figure 2.7). Only a single layer of beige paint was found on the underlaying siding. This implies that the house may not have been painted the next color, grey, until addition of HABS Room 4. Therefore, the Main House was painted beige at the time the circa 1860 photographic image of the house was made (Figure 2.3).

It is believed that the house was painted grey sometime during the 1860s, but this has not been confirmed by any historic documentation or recollections. From paint analysis results, the entire exterior of the house appears to have been painted medium grey. It is unknown what color the shutters may have been painted. This color scheme survived until application of two-tone green paint finishes around 1874.

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[140] Emma Dent Casey, *When Grant went A-Courtin' - By His Wife's Sister: Emma Dent Casey*, (Undated copy of twenty-six page typewritten manuscript in MHS, St. Louis, circa 1908), 2 (hereafter cited as Casey, *Grant*). There is some disagreement as to the identity of the author of this manuscript. See Stone Building, Architectural Analysis for further discussion.

Grey paint was also applied to interior trim and millwork which may have coincided with the exterior application of grey paint. Samples of wallpaper from Room 103 compliment the grey interior paint. The top layer has a Rococo-Revival foliated pattern that was block printed and manufactured in France between 1845 and 1855 (see Appendix E, Wallpaper). However, it is unknown when the wallpaper was applied. Two other papers underlay the Rococo-Revival paper (see Appendix E, Wallpaper and Room Finish Survey, Dining Room 103).

PHASE V - 1868 to 1913

Ulysses S. Grant (1865-1885)
William Vanderbilt (1885-1888)
Luther Conn (1888-1905)
James Hughes/St. Louis Development Corporation (1905-1913)

Although this chronological period is quite lengthy, there is little evidence that substantial renovation work occurred on the house during this time period.[141] Grant probably never had any decision in cosmetic alterations such as paint color or wallpaper; there is only one piece of documentary evidence that he ordered changes to the house during his ownership. In a letter dated November 24, 1870, from Grant to his caretaker William Elrod, Grant ordered Elrod to construct a large addition to the house,[142] but there is no other evidence that any addition of substantial size was constructed. Although Grant owned the house, he did not intend to live in it, instead ordering his tenants and farmhands to occupy the building.[143] After 1875 Grant lost interest in the farm although he continued to own the place until 1885 (see Ownership History).

Room 4 shown in the 1940 HABS drawings was probably constructed during Grant ownership as it appears in an 1875 engraving of the house and grounds (Figure 2.7). Room 4 enclosed the space beneath the rear porch roof where the porch deck did not exist (see Phase IV).

It is improbable that William Vanderbilt made changes during his brief ownership period between 1885 and 1888; he probably never even visited the place although tenant Henry Leis continued to occupy the house. Although Luther Conn "indulg[ed] his tastes for fine horses and cattle" during his ownership of the property from 1888 until about 1905, he probably made few changes to the house.[144] In fact, Julia Grant and Fred Dent Grant commented "...on how well-preserved the farm was" during a visit in 1896.[145]

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[141] Grant and Luther Conn had influence on other structures on the property however. See Division 3 - Stone Building and Division 4 - Barn.

[142] Fisher, *Grant's Letters*, 34.

[143] USG, *Papers*, 17:27, USG Letter to WA, 15 January, 1867; 18:559, USG Telegram to Helen Barrett, St. Louis, May 6, 1868. "My family expect to occupy Wishton Wish this Summer."

The only detectable additions Conn may have made were the addition of Room 5 seen in the 1940 HABS drawings and construction of a wooden canopy north of Rooms 4 and 5 as seen in early Wenzlick photographs (Figures 2.13 and 2.14). A door and section of West Wing siding uncovered from within the south wall of Closet 108-A during a 1993 physical investigation were found to be painted in a two-tone green. It is believed that the exterior of the house was painted in that color scheme around 1874 (see Materials Analysis, Paint). Therefore, Room 5 was added sometime between 1875 and 1913 when the room addition exterior was first photographed (Figure 2.13).

The Main House was abandoned and allowed to deteriorate between 1905 and Albert Wenzlick's purchase in 1913. During this time the property was owned by the St. Louis Development Corporation that unsuccessfully attempted to develop an amusement park.[146]

In the first floor plan of the 1940 HABS drawings, there appears to be an engaged post drawn in the northwest corner of Room 5. When the rear porch post spacing (6 feet 7½ inches indicated on the plan) was marked west along the north wall of Room 5, it was found that the engaged post is twice that distance, plus the approximate 8 inch face dimension of the posts, from the western-most isolated post. Another post was once existed at the east window of Room 5, but was removed to construct the room enclosure.

By 1890, irregularly spaced wooden piers replaced the continuous stone porch foundation beneath the first floor porch posts (Figures 2.11 and 2.15). Spaces between the piers were infilled with wooden diamond patterned lattice skirt. Back porch lattice skirts seen in a 1913 photograph (Figure 2.13) match the appearance of the front porch lattice skirts as seen in Figure 2.15. Since the front porch skirt was changed from stone to wooden diamond lattice between 1883 and 1890 (Figures 2.8 and 2.11), this indicates that back porch diamond lattice skirts may have been installed during the same period of time.

The 1940 HABS Room 4 was probably used as a kitchen during this time. While no chimney is shown in the 1875 lithograph, it is improbable that house occupants would have continued to rely upon fireplaces into the second half of the nineteenth century while fuel efficient cast iron cook stoves were readily available in St. Louis since the first half of the nineteenth century. A wood or coal burning cook stove in a rubbish pile next to the Ice House can be seen in a 1913 Wenzlick photograph (Figure 2.12). It is possible that the stove was removed from the kitchen when the house was abandoned. The style of that stove is very similar to those offered in the 1870s and maybe earlier.[147] The small brick chimney at the northwest corner of HABS Room 4 indicates that cooking and/or heating functions were in place. That chimney was probably braced and supported from the wall rather than ground supported as no masonry pier can be seen in later Wenzlick photograph (Figure 2.22). The brick chimney may have had an inefficient draft as a length of sheet metal stove pipe was added to extend the flue crown height.

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[144] Hyde & Conrad, *Encyclopedia of the History of St. Louis* (New York: Southern History Company, 1899), 466.

[145] KSL, *White Haven*, 278.

[146] KSL, *White Haven*, 278.

Three items were found in a cavity between two vertical logs of the West Wing north wall during physical investigation work conducted in 1992. A glass "Henry Rooke and Company" soda bottle, a coupon from the "Kee-Kee Tea Co.," and an announcement card from the "Sixth Street Tabernacle Sunday School." It is suspected that these items were placed in the wall prior to or during finish removal work as the items were suspended within the old plaster keys. The bottle was found to have been manufactured during the 1879 to 1886 period.[148] The period of shared existence between the Kee-Kee Tea Co. and the Sixth Street Tabernacle was between 1887 and 1888.[149] Since the bottle could have only been placed in the cavity through a substantially sized hole in either side of the wall, it is suspected that some renovation work took place in this area of the house sometime between 1886 when the bottle was last produced, and 1914 when Albert Wenzlick began his renovation work. Whether the work was to convert that room into a kitchen or some other purpose remains unknown.

By the time Albert Wenzlick purchased the property in 1913, a wood frame canopy had been added to the north side of HABS Room 4 (Figures 2.13 and 2.14). The canopy is not indicated in the 1875 Frank Leslie engraving (Figure 2.7). The reason for this addition may be that it provided shelter during inclement weather as the occupants gathered water at the cistern. However, the cistern was not completely protected by the canopy. Another possible reason for the canopy's construction was to protect wood fuel from the elements as by that time a portion of the addition had been converted to a kitchen. Yet another reason may have been to collect and divert water to the cistern. The canopy roof was contiguous with the HABS Room 4 roof plane and supported by three solid wooden posts which rested directly on, or were placed into the ground. Wood framing which spanned between the posts and HABS Room 4 was slightly arched.

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[147] *The Winthrop Wrought Iron Hot Air Furnace, Manufactured Only By Dighton Furnace Company, North Dighton, Mass* (Boston: Dighton furnace Company, ca. 1874), 32, *Cooking and Heating Stoves, Cast Iron Ranges, Steel Ranges, Oil Stoves, Gasoline Stoves, Gas Stoves* (Cleveland, Ohio: Cleveland Co-Operative Stove Co., ca. 1893), n.p. (engravings of cook stoves), and Will and Jane Curtis, *Antique Woodstoves - Artistry in Iron* (Ashville, Maine: Cobblesmith, 1974), 52-61. While testimonials in the Dighton catalog are in the Boston area, other foundries throughout the United States, including those in St. Louis, were probably casting stoves of similar style. Stoves were shipped to all parts of the United States from several large stove works based in St. Louis beginning in the 1840's (Michael A. Capps, "Keeping the Home Fires Burning-St. Louis' Stove Making Industry," *The Museum Gazette* (St. Louis: Jefferson National Expansion Memorial, February 1991). As the Cleveland based company shows, wood burning cook stoves toward the end of the nineteenth century were much more elaborately decorated and sophisticatedly designed then the stove seen in Figure 2.12. Photographic examples offered in Curtis clearly show that cook stoves became larger and more elaborate as time progressed in the latter half of the nineteenth century.

[148] *The Foland Celebrated Date Dictionary For Bottle Collectors, 1845-1900, Vol. 1 - Soda and Mineral Water Manufacturers* (Kirkwood, Missouri: L. Lee Foland, 1971), unpaginated pamphlet. The "Henry Rooke" company was located at 508 Barry in St. Louis according to the pamphlet. The bottle remains in the ULSG collection.

[149] *Gould's St. Louis Directory*, (1887), 1574, Gould's St. Louis Directory, (1888), 1525 and 1574. The only year that the Sixth Street church is listed in the directories is 1887. While there was no listing for the Kee-Kee Tea Company, there were several men named Kee each of the 1887 and 1888 directories. The company may not have been in existence very long. However "A. H. Beadle Printing Co., 409-411 Morgan St.," also printed on the coupon, was found to exist at that address only during 1888.

Figure 2.13 shows steps, railings, and lattice skirts at the back porches. These elements were probably in place during Luther Conn ownership, because the house had been abandoned from 1905 until these photographs were made in 1913. In Figure 2.13, each of the North and Hunt Porches have open riser wooden stairs with cut end stringers. It appears that stringers and steps were constructed of lumber at least 1½ inches in thickness. While the top step on the rear porch stairs protrudes from the porch deck, the Hunt Porch top step begins near the bottom of the porch skirt board. The skirt boards measure about 10 inches wide.

Careful analysis of the lattice skirt in the Figure 2.13 reveals that the laths measured between 1¼ inches and 1½ inches in width and were set at 60-degree angles with respect to the ground. The lattice frame was set in back of the laths and, therefore, was not exposed. Each of the lattice skirts were tucked behind the concealed face of the porch skirt board and continued behind the rear porch stairs. As mentioned above, back porch lattice skirts matched the appearance of the front porch skirts in 1913 photographs. The back porch skirts were probably installed during the 1883 to 1890 period when the front porch skirts were installed.

The north end of the Hunt Porch is difficult to describe from Figure 2.13. It appears that deteriorated stone and some brick were placed beneath the skirt board. A white band immediately beneath the skirt board has the appearance of a 4 inch thick concrete slab or sheet metal that had been folded over. By the 1930s this conglomeration was replaced by the traditional lattice skirt as seen in Figure 2.22.

The only porch railing visible in Figure 2.13 is at the north bay of the Hunt Porch. The railing image consists of top and middle board rails with an intermediate post. The haphazard appearance of the railing indicates that it may have been added sometime after construction of the porch.

Half round gutters and downspouts had been added to most of the building by 1890 (see Figure 2.11). That system may have survived until 1913 when the site was purchased by Albert Wenzlick (see Figures 2.13 and 2.15). Two sections of downspout elbows, painted dark green, were found on the site in 1992. One of those sections matches very closely to the downspout that fed the cistern at the northwest corner of the canopy as seen in Figure 2.13.

The age of the roof shingles in the 1913 photographs is unknown. However, the apparent poor condition of the shingles indicates that the shingles had probably been in place since Grant ownership of the property. Forty-nine exposures are visible at the north roof of the Long House in Figure 2.13. Roof ridge types varied. The Long House ridge was capped with shingles, while ridge boards capped the Hunt Addition gable roof and East Wing roof.

The Main House exterior was painted a two-tone green during the summer of 1874 (see Materials Analysis, Paint, and Appendix D, Paint Analysis). Photographs and personal recollections verify that this color scheme remained in place until just after 1913 when Albert Wenzlick painted the house light grey. Paint analysis suggests that most interior trim at the first floor was painted dark green.

PHASE VI - 1913 to 1940
Albert and Emma Wenzlick (1913-1937)
Estate of Albert and Emma Wenzlick (1938-1940)

Early Wenzlick photographs show the house was in poor condition by the time Albert Wenzlick acquired the property through a foreclosure sale in 1913. The structures were so dilapidated that Wenzlick may have purchased the property only after persistent persuasion inflicted upon him by his wife.[150] Wenzlick was instrumental in repairing the structure to a serviceable condition for use as a full-time summer residence and as a weekend winter retreat. He was also responsible for several modifications in response to the building's poor condition and the want of contemporary utilities.[151] However, Wenzlick did not significantly enlarge nor demolish portions of the house.

Some of the first work performed by Wenzlick was in an effort to stabilize the building and make it habitable for use as a summer residence.[152] Replacement of the eastern half of the Long House stone foundation, foundation sills, and stud bases with cast concrete may have been in response to severe termite damage and perhaps a deteriorated foundation. He also reroofed the building with wood shingles and later with red roll roofing. During the process of reroofing work, he extended the rake cornices 6 inches beyond perimeter wall surfaces and replaced all gutters and downspouts. There may have been work on the southwest corner of the West Wing as evidenced by the removal of siding as seen in Figure 2.16, but the extent of, or reason for, the repair work on the vertical logs is unknown.

Perhaps the most visible of external changes Albert Wenzlick made to the house was the addition of three dormers to the main roof; two of which remain today at the south roof.[153] He also changed some of the second floor windows from double hung to casement style.

Wenzlick added a second floor bathroom to the north end of Bedroom 201 (See 1940 HABS drawings, Sheet 1). This necessitated the routing of pipes through the north perimeter wall and the floor structure which damaged some structural members. Wenzlick also added bathroom conveniences to the small room of the Hunt Addition.[154]

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[150] 150. Marjorie Abbott Felice Letter to Save Grants White Haven, Inc., 19 March, 1986.

[151] 151. James Davis to the author, 13 April, 1993. Albert hired two plasterers to constantly repair and patch the interior wall and ceiling finishes. According to James Davis, Albert had no intention of undermining the historic integrity of the house.

[152] 152. Marjorie Abbott Felice Letter to Save Grants White Haven, Inc., 19 March, 1986. It was not until between 1914 and 1918 that Albert Wenzlick actually began to occupy the house on a regular basis. Caretaker Charlie Davis and his family lived in the Main House full time until Albert had the Cottage constructed for them.

[153] 153. Marjorie Abbott Felice Letter to William Bodley Lane, 5 August, 1987. The attic was needed for a dormitory as the Wenzlick had many visitors.

[154] 154. Bill Wenzlick to the author, 30 July, 1992. The toilet and lavatory were against the south wall, and a claw-foot bathtub against the north wall.

In Figure 2.20, the East Wing hall opening seen in the 1890 photo (Figure 2.11) is enclosed by a double hung window similar in appearance to windows on the house. A butt joint in the siding above the east jamb confirms that the hall was indeed closed off at the south elevation, similar to the door being added at the north elevation. The window in the small Hunt Addition room (as seen in Figure 2.5) may have been replaced by a door and salvaged for use in the East Wing when Wenzlick converted the small room into a bathroom. Concurrently, Wenzlick may have added a doorway between the large Hunt Addition room and the East Wing hall. He was responsible for replacement of the saw-tooth fascias on the East Wing with plane boards.

Wenzlick extended the west edge of the Hunt Addition porch by about 4 feet and screened in the entire porch. The porch may have been used as a dining room during warm weather (see Figure 2.22 and Appendix I, Lila Metcalf Wenzlick Sketch).

When Wenzlick took control of the property, the shutters were in very poor condition (Figures 2.13 and 2.15). Most had loose joints, missing slats, or were completely missing. Wenzlick removed all of shutters, but apparently left the original hand wrought hinge hardware on the casings. The disposition of the shutters is unknown.

The HABS Room 4 exterior steps were replaced with a balustered stoop and steps and the canopy was completely removed. Wenzlick also removed the metal stove pipe from the kitchen chimney, and removed some of the lattice skirt from beneath the HABS Room 4 crawlspace and rear porch. By comparing Figures 2.13 and 2.22, steps leading to the rear porch were removed and rebuilt.

During this period Wenzlick added a gravity water heating system including a riveted underground fuel storage tank just west of the house. Substantial modifications were made to the central chimney stack to install a flue from the basement to the smoke chamber of the first floor Fireplace FP3. He also installed the first electrical, water, and waste systems throughout the house.

PHASE VII - 1940 to 1990

Delbert Wenzlick (1937-1979)
Heirs of Delbert Wenzlick's Estate (1979-1986)
St. Louis County/State of Missouri (1986-1990)

The bulk of the Main House remained virtually unchanged since the last Dent and Grant modifications until Albert's son Delbert Wenzlick acquired the property and initiated extensive renovation work beginning in 1940. Delbert Wenzlick intended to use the house as a full-time residence soon after he purchased the property from his father's estate. While Delbert maintained the historic character of the building through installation of new replicated millwork, much historic fabric was lost at that time.

The most radical alteration to the character and integrity of the house was the total demolition of the Hunt Addition, East Wing, rear porch, and HABS Rooms 4 and 5. Wenzlick removed the Hunt

Addition and East Wing because they had become too deteriorated to repair.[155] The existing breezeway was then constructed in two phases in the area of the Hunt Addition, joining the house to the Stone Building.

Six windows were added to the north, east, and south elevations of the Long House where none previously existed. The newer window millwork profiles match that of the historic windows so closely that distinction can only be made through comparison of paint and wood samples, and close examination of the profiles. In addition, many of the window sashes and probably all of the shutters were replaced. Wenzlick salvaged the only remaining Hunt Addition window and one window from the East Wing and incorporated them into the house. All but one of the original hand wrought shutter hinges were removed and replaced with cast iron self-holding style hinges.[156] All of the sill mounted shutter catches were also removed.

The 1940 HABS Rooms 4 and 5 were extensively modified. The crawlspace area beneath this portion of the house was excavated to construct a basement apartment. The floor was completely removed and raised to the level of the West Wing floor. All walls were demolished and rebuilt. To provide circulation between the new basement rooms and the West Wing basement Room 003, an opening was cut through the stone foundation wall. In comparing the 1940 HABS drawings to existing conditions, differences were found in placement of walls, windows, and doors at the first floor level. The perimeter walls of Room 106 were completely removed and rebuilt by the Wenzlicks during their renovation work.

The existing kitchen was constructed in the area once occupied by the rear porch; the pitch and plane of the old porch match the rear porch roof line. To provide circulation between the kitchen and the house, a window was converted into a double swinging door, Door 103-D4. The door for this opening was salvaged from existing door opening 103-D1, and the south casing from the from a doorway in HABS Room 4. The kitchen was expanded to the north during the 1950s to include a Breakfast Room 108.[157] Cast concrete foundation crawlspaces were added beneath the kitchen addition and the roof was extended.

Wenzlick added five new bathrooms. The second floor bath initially constructed by Albert Wenzlick was split into two bathrooms. This caused the removal and damage of much structural, floor, and wall fabric in that area.

Wenzlick constructed the internal basement Stair S-3, requiring the removal of one log joist and the loss of the former under-stair closet floor and wall finishes.

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[155] Informal interviews between Bill Wenzlick and the author.

[156] Bill Wenzlick to the author, 10 August, 1993. Wenzlick stated that the hand wrought hinges were left in a box in the Workshop when the property was turned over to the St. Louis County government. The hinges have not been located.

[157] Bill Wenzlick to the author, 30 January, 1995. The builder of the kitchen addition was Herman Metz.

The crawlspace beneath Living Room 101 was deepened around 1950 to a full basement to provide space for Wenzlick's model trains. Somehow Wenzlick managed to retain the cast concrete walls installed by Albert, and build new concrete block walls beneath them. The west wall of this room was framed with salvaged studs. The crawlspace in Mechanical Room 002 was also dug out. Apparently, this area was filled when the West Wing basement was constructed during the 1830s (see Room Finish Survey, Basement Room 002).

The house was modified to provide for an extensive forced air heating and cooling system. This entailed the furring of several walls and the cutting of joists, beams, and studs to provide duct chase space. The previous gravity boiler system was completely removed. In addition, Wenzlick accomplished the following work:

- Replaced most of the plaster finishes and about half of the wood lath systems.
- Laid new wood floors over the historic wood floors.
- Modified most of the doors and chimney pieces to accommodate the new raised floor system. Chimney piece leg plinth blocks were removed.
- Replaced the Living Room 101 fireplace chimney piece with a reproduction. The historic chimney piece was later given away.
- Modified all hearths in response to raised floor levels.
- Added closets to second floor bedrooms.
- Insulated most external wall and second floor ceiling cavities.
- Covered the roof with cement/asbestos shingles and installed copper gutters and downspouts.
- Removed the north dormer constructed by Albert Wenzlick.
- Modified the exterior cellar entry as an external step-down stair. Replaced the short board door with a glazed and paneled door.
- Installed knotty pine board finishes and wood strip flooring in the West Wing basement room prior to 1945.[158]
- Replaced the first floor porch deck as many as three times.

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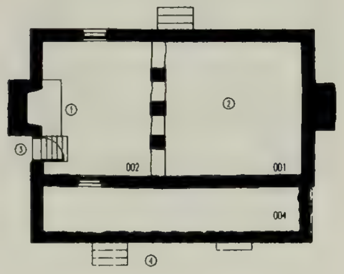
[158] Bill Wenzlick to the author, 8 December, 1994. Room 003 served as a workshop until its rehabilitation as an Delbert's office. Wenzlick recalled that the walls were paneled by the time he arrived home in 1945 from the service during World War II.

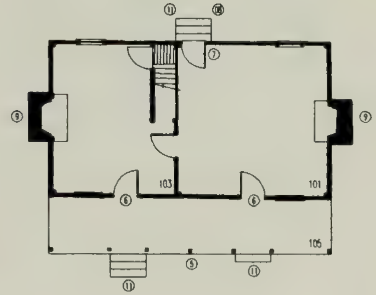
♦ Expanded and modified the electrical systems.

After Delbert Wenzlick's death in the house in 1979, major renovation work was superseded by routine maintenance performed by Bill Wenzlick and St. Louis County Park and Recreation Department. Holes were punched through selected walls and ceilings by local architect William Bodley Lane, who was hired St. Louis County to perform a physical investigation on the house. In addition, an unknown quantity of siding was removed from below Window 103-W2 and at the southwest corner of the West Wing to remove wood samples for a dendrochronology study. The County stripped the first floor front porch posts, removed a breezeway pergola, painted and caulked the exterior, and repointed the chimney crowns.

HISTORIC BUILDING CHRONOLOGY DRAWINGS



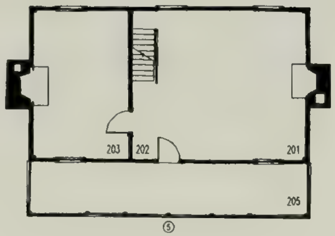
BASEMENT FLOOR PLAN
SCALE 1/8" = 1'-0"
0 1 5 10



FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"
0 1 5 10

PHASE I: 1818
OWNER: William Lindsey Long (1808–1818)
The initial construction of the two-story portion of the house occurred during William Lindsey Long's ownership of the property. However, it is believed that while Long may have begun construction, he did not complete the house and may have never resided in it. Documentary evidence suggests that the house was incomplete when Theodore Hunt purchased the property in 1818. The house had two rooms on each floor; the second floor was serviced by a stair possibly enclosed with wood panels or boards. The structure was constructed of red and white oak hand hewn post and beam, and sided in hand rived and planed white oak siding. Foundation and chimney stacks were constructed of locally quarried limestone rubble set in dirt and lime mortar, and pointed in sand/lime mortar. The principal architectural element on the building was, and continues to be, the two-story gallery of the south elevation. The roof was probably protected with wood shingles although it is unknown if the shingles were sawn or shake, oak, cedar, or pine. Tongue and groove pine floors, plastered walls and ceilings, and four fireplaces may have been completed by the next owner. The house had nine over six style double hung windows, and six raised panel doors. The exterior window shutters had hand wrought iron hardware.

① The full-cellar, west half of the basement used for the storage of foodstuffs and/or possibly used as a kitchen. There may yet be the remains of a fireplace encased within the existing center chimney stack, but this is conjectural.
② Eastern half of the basement crawlspace, rough stone piers may have supported the first floor girt.
③ Access to the basement probably through a short cellar door located at the southwest corner of the house. There was no internal stair leading to the cellar.
④ Porch foundation constructed of stone.
⑤ First and second floor porch posts originally aligned over each another.
⑥ Physical evidence indicates a door opening off of the front porch into each of the two first floor rooms.
⑦ Location of the back door conjectural.
⑧ It is unknown if a covered porch existed at the rear of the house.
⑨ Chimney stacks may have been completed by next owner Theodore Hunt.
⑩ Physical evidence shows that attic windows may have been installed after initial construction of the house.
⑪ Stoops conjectural.
⑫ Driveway conjectural for this time period.



SECOND FLOOR PLAN
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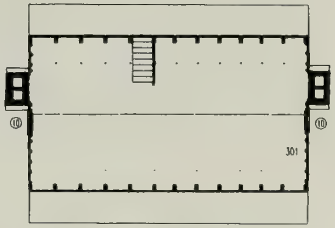

ATTIC FLOOR PLAN
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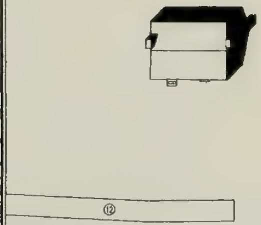


SITE PLAN
SCALE 1/30" = 1'-0"

SHEET TITLE
HISTORIC BUILDING CHRONOLOGY
PHASE I: 1817-1818
WHITE HAVEN
ULYSSES S GRANT NHS
ST LOUIS, MO

DESIGNED

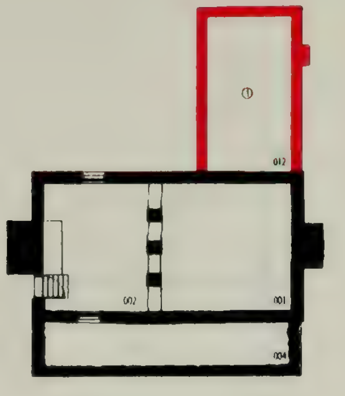
DRAWN
K. R. MAROLF
L. M. JOHNSON
TECH REV.
A. W. O'BRIGHT

DATE
8/30/93

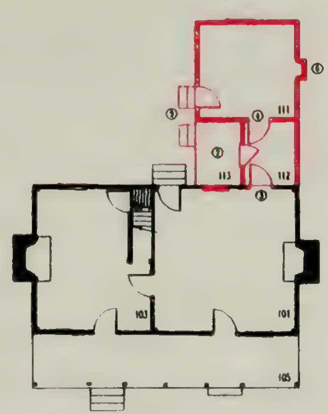
DRAWING NO
357/80005

AUTOCAD FILE
WHCRFP01

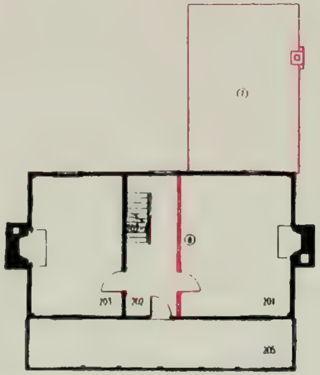
SHEET 1
OF 7



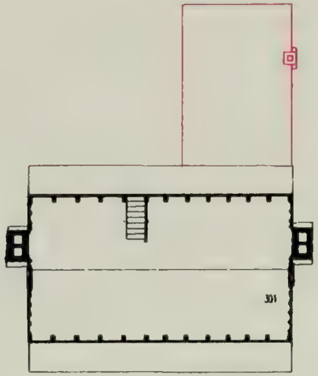
BASEMENT FLOOR PLAN
SCALE 1/8" = 1'-0"



FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"



SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"

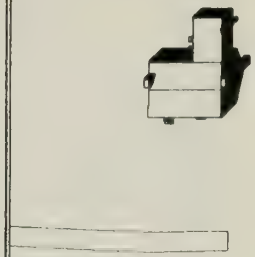


ATTIC FLOOR PLAN
SCALE 1/8" = 1'-0"

PHASE II 1818–1820
OWNER Theodore Hunt (1818–1820)

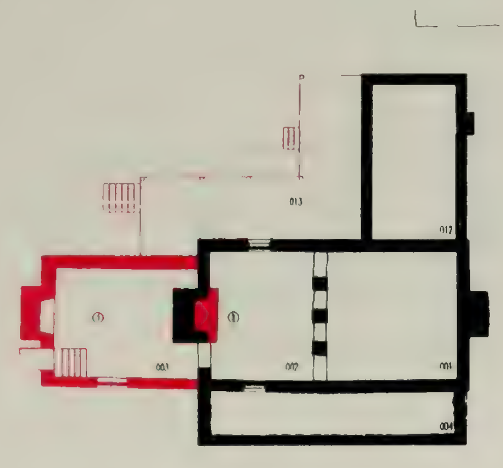
The Hunt family is believed responsible for the completion of the house begun by Long, including installation of flooring, plaster finishes, and chimneys. During their brief ownership of the property they also completed construction of a two room addition at the north elevation. The addition is included on the earliest known illustration of the house dating to 1840. The Hunt Addition featured two rooms, the largest of which is suspected to have functioned as a sitting or drawing room. Ten foot ceiling height and presence of a chair rail indicates that the room may have been a formal space. The function of the small room is unknown, but it may have been a storage room for coal, wood or household items. From 1940 HABS photographs it is determined that the addition was of heavy braced frame construction. Originally, the roof was flat. The interior was finished with plaster over split wood lath, and the exterior covered with sawn clapboards. The fireplace was constructed of stone and was only large enough for space heating purposes. The Hunt Addition was demolished in 1940

① Rubble limestone foundation probably formed a very shallow crawlspace.
② Photographic evidence indicates that a small covered porch may have been constructed in the ell formed by the Long House and the Hunt Addition.
③ Window moved several feet to the east. The old window opening was replaced with a door opening into the small room.
④ Photographic evidence indicates a door was in this area at one time, but the date it was enclosed is unknown.
⑤ Porch stoops conjectural
⑥ Fireplace and chimney probably constructed entirely of stone.
⑦ Flat roof may have been covered with tin or painted canvas.
⑧ Wall may have been added to second floor to create stair hall.

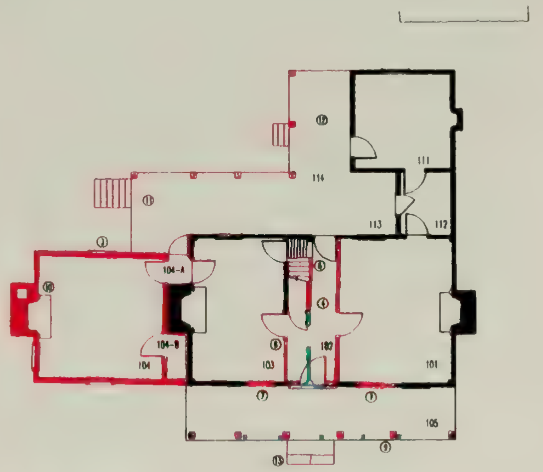


SITE PLAN
SCALE 1/30" = 1'-0"

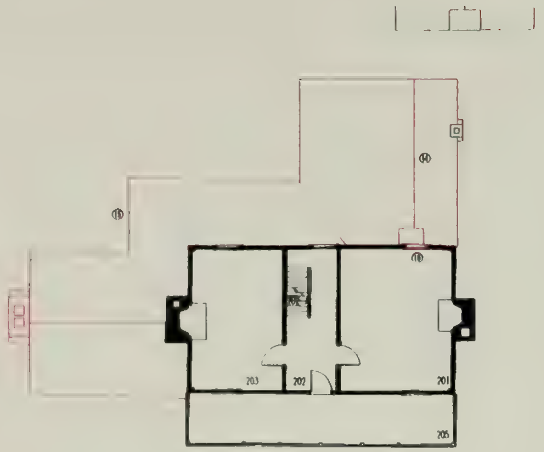
SHEET TITLE HISTORIC BUILDING CHRONOLOGY PHASE II: 1818-1820 WHITE HAVEN ULYSSES S. GRANT NHS ST. LOUIS, MO	DESIGNED	DRAWING NO 357/81005
	DRAWN K. R. HARDLE C. R. JOHNSON TECH. REV. A. W. O'BRIGHT	AUTOCAD FILE WHCRFP02
	DATE 8/30/93	SHEET 2 OF 7



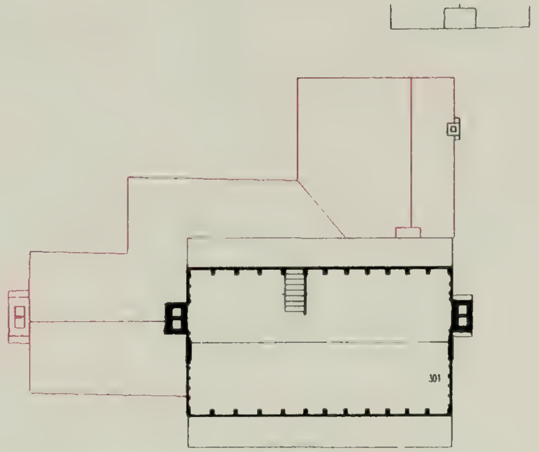
BASEMENT FLOOR PLAN
SCALE 1/8" - 1'-0"



FIRST FLOOR PLAN
SCALE 1/8" - 1'-0"



SECOND FLOOR PLAN
SCALE 1/8" - 1'-0"

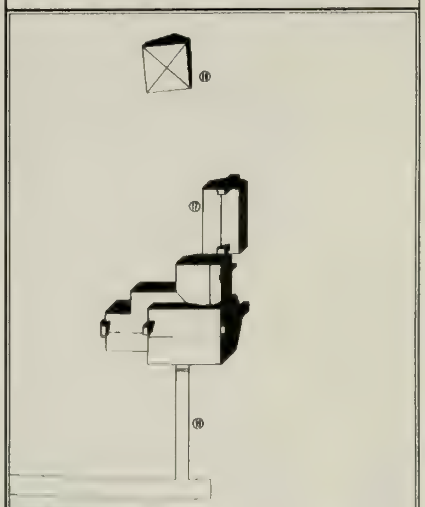


ATTIC FLOOR PLAN
SCALE 1/8" - 1'-0"

7PHASE III 1820 1840
OWNER Frederick Dent (1820 1865)

The first substantial improvements made by the Dents included the addition of the West Wing, North Porch, and Hunt Addition porch and gable roof. It is believed that these changes took place before 1848 when Frederick Dent attempted to sell White Haven, advertising that the house as containing nine rooms. Substantial renovation also took place on the front porch, first floor room layouts and circulation routes, front entry and windows, and the stair to the second floor. This renovation work may or may not have occurred during construction of these additions, but documentation suggests that these renovations were completed by 1846. The West Wing is believed to be part of a separate building joined to the Long House around 1838. Its walls are constructed of vertical logs in the French Colonial tradition. The exterior was painted beige, and may have been trimmed with dark brown by the end of this phase.

① Hunt Addition basement probably served as a winter kitchen. The only access to the cellar was through a short door and down a steep stair
② The previous cellar fireplace may be sealed behind stone wall, and the corresponding cellar room (002) filled with soil excavated during construction of the winter kitchen
③ It is unknown if this opening was a door or window
④ The central hall (102) originated through the addition of a partition splitting room 101 into two spaces
⑤ The boxed stair was opened into the new stair hall. The complete stair may have been replaced at this time
⑥ Portion of east wall of room 103 moved west with door
⑦ Front entry removed and replaced with window
⑧ Greek revival door constructed as new front entry
⑨ First floor porch posts removed and replaced with boxed Greek revival posts set between doors and windows
⑩ Room 101 chimney piece moved to room 104. Greek revival chimney piece installed at room 101 fireplace
⑪ Extent of North Porch and stoop conjectural
⑫ Covered porch added to Hunt Addition west elevation. Porch stoop conjectural
⑬ It is unknown if the present stone stoop remained from the initial construction of the house or if the original stoops were modified in response to the revised entry
⑭ Gable roof constructed over flat Hunt Addition roof
⑮ Extent of North Porch roof conjectural
⑯ Bedroom window modified in response to construction of Hunt Addition gable roof
⑰ Stone Building constructed by this period. The structure probably served as a summer kitchen
⑱ Ice House constructed by this period. It initially may have had a full-story superstructure with hipped roof
⑲ Walkway and drive documented to have existed by 1840 7PHASE IV 1840 1868

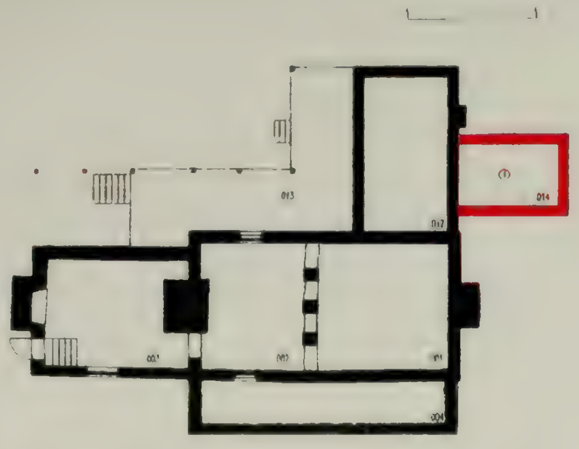


SITE PLAN
SCALE 1/30" - 1'-0"

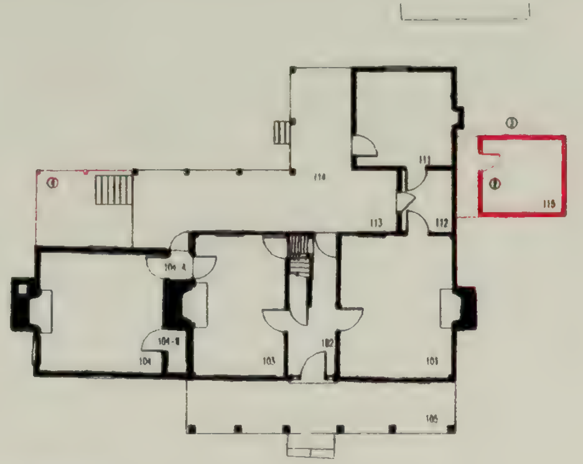
SHEET TITLE
HISTORIC BUILDING CHRONOLOGY
PHASE III. 1820 1840
WHITE HAVEN
ULYSSES S GRANT
ST LOUIS, MO

DESIGNED:
DRAWN:
K R MAROLF
L M JOHNSON
TECH REV
A W O'BRIGHT
DATE
8/10/93

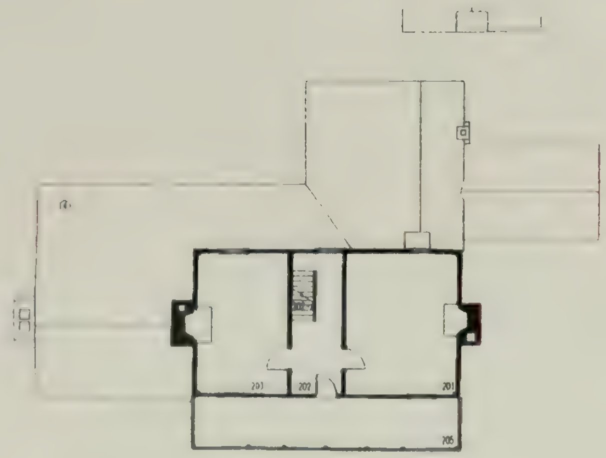
DRAWING NO.
157/80005
AUTOCAD FILE
WHCRFP03
SHEET 3
OF. 7



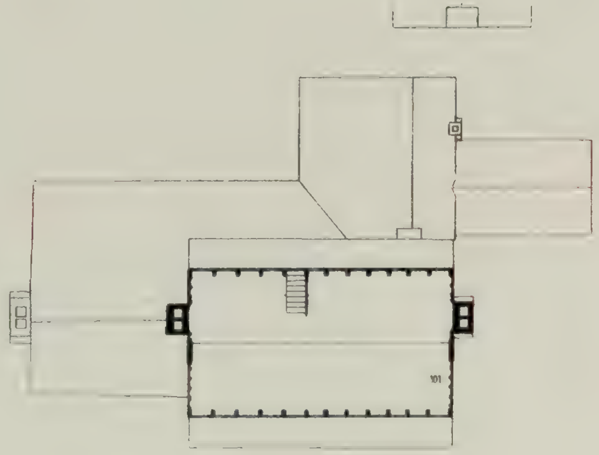
BASEMENT FLOOR PLAN
SCALE 1/8" = 1'-0"



FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"



SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"

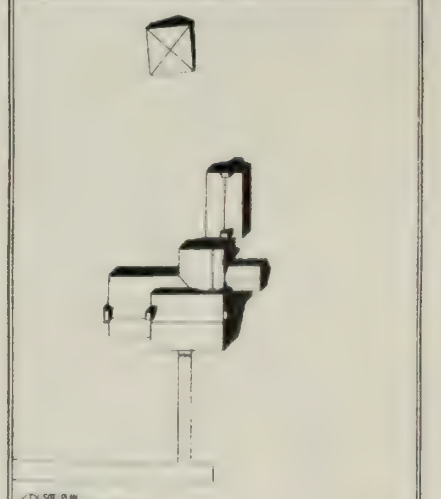


ATTIC FLOOR PLAN
SCALE 1/8" = 1'-0"

PHASE IV 1840-1868
OWNERS Frederick Dent (1820-1865)
Ulysses S. Grant (1866-1885)

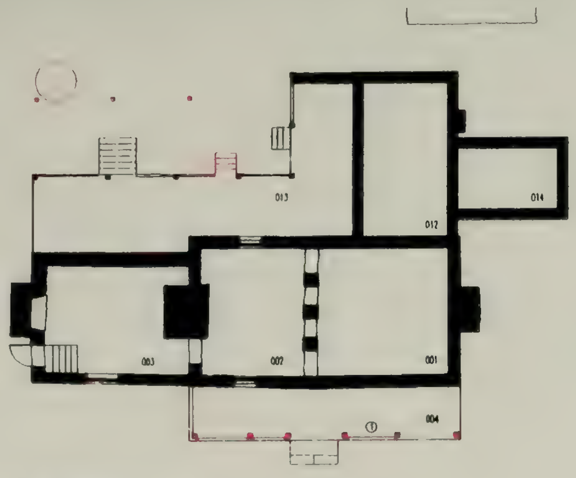
The only substantial addition made to the Main House between 1840 and 1868 was the construction of a one-room wing off the east elevation of the Hunt Addition. The date of construction of the now demolished East Wing is unknown, but the wing was extant by 1868 as shown in an early illustration of the house. Absence of evidence for a chimney or other heating appliance suggests that the East Wing functioned as a warm weather bedroom. It is possible that the wing was constructed as a bedroom for the older Dent children who returned from college during summer months, or as a guest room. From existing documentation there was apparently not no direct circulation route between the Hunt Addition and the East Wing. Access could be gained only from either end of a narrow hall separating the two additions. Existing paint evidence shows the house was painted beige with dark brown trim until the 1880s when a light to medium gray paint was applied.

① The East Wing had a shallow rubble limestone foundation.
② Access to East Wing room 115 gained through a narrow hall entered from the exterior. The room's interior was unheated and very simply decorated.
③ It is believed that this window was added after construction of the East Wing.
④ A second roof was constructed over the East Wing north roof by 1868. The "canopy" roof was simply supported by posts; there was no porch deck beneath the roof.

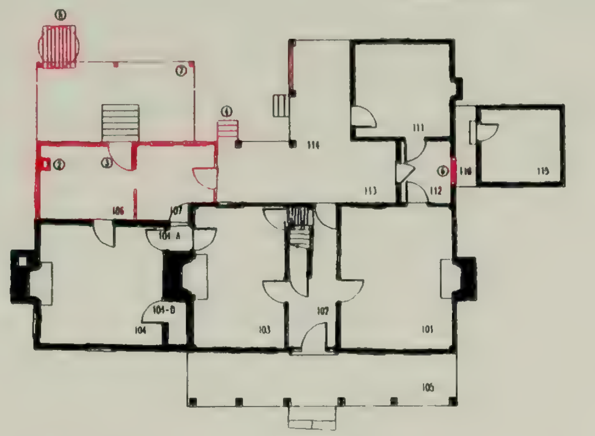


SITE PLAN
SCALE 1/32" = 1'-0"

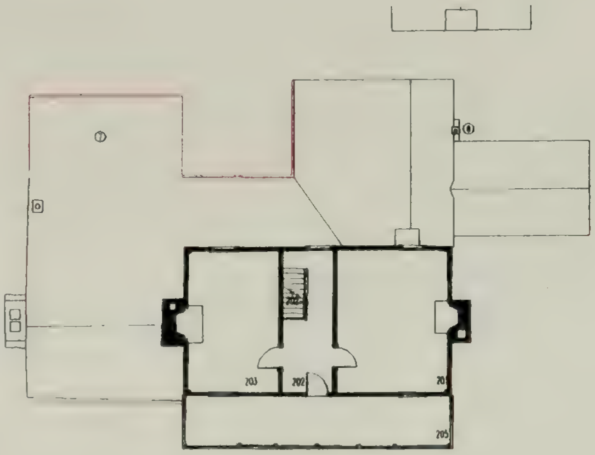
SHEET TITLE HISTORIC BUILDING CHRONOLOGY PHASE IV 1840 1868 WHITE HAVEN ULYSSES S GRANT ST LOUIS, MO	DESIGNED	DRAWING NO [illegible]
	DRAWN [illegible] A. W. O'BRIGHT	AUTOCAD FILE [illegible]
	DATE 8/30/93	SHEET 4 OF 7



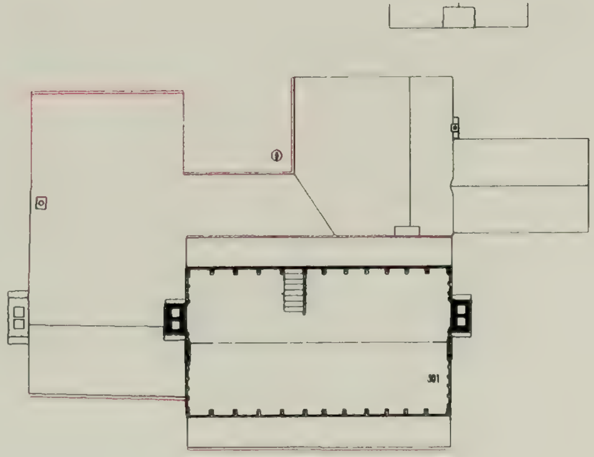
BASEMENT FLOOR PLAN
SCALE 1/8" = 1'-0"



FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"



SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"

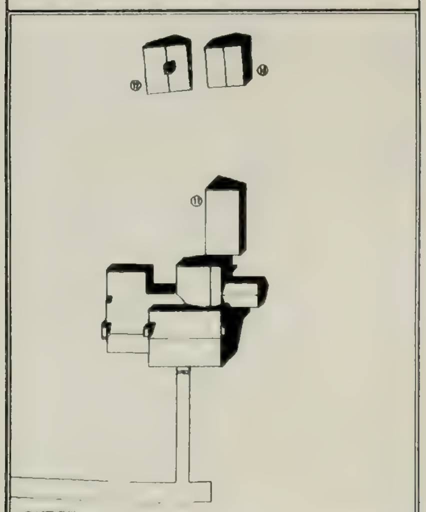


ATTIC FLOOR PLAN
SCALE 1/8" = 1'-0"

PHASE V 1868-1913
OWNERS: Ulysses S. Grant (1866-1885)
William Vanderbilt (1885 1888)
Luther Conn (1888 1905)
James Hughes/St. Louis Development Corporation (1905-1913)

Construction of two small rooms at the rear of the house are the only significant modifications yet recorded in addition to a host of smaller changes. The first room, 106, was constructed before 1875, and probably served as a kitchen for Grant's caretakers. Bare earth, open space beneath the North Porch canopy roof provided room for its construction. Construction of the second room, 107, occurred before 1913. It is believed that this room functioned as a pantry or mud room. Also by 1913 a canopy roof was built beyond the north elevation of the room 106 and 107 additions. Shutters and associated hardware are believed to have been replaced by 1883. Documentary evidence indicates that the house was painted bright green trimmed in dark green and black in 1875.

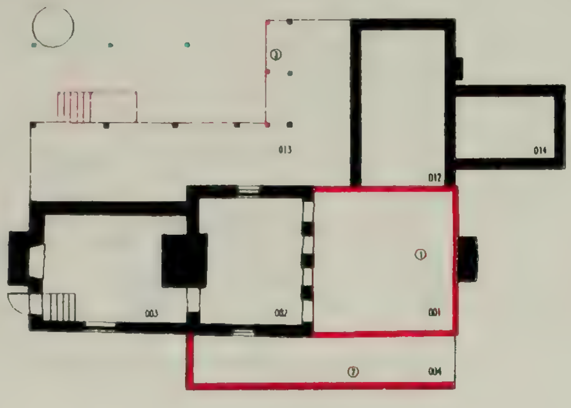
① Front porch stone foundation wall demolished and replaced with wooden posts and lattice skirt by 1880.
② The kitchen chimney is first documented in 1913 although it is suspected that it is much earlier than that. The chimney was wall supported rather than founded on the ground.
③ Exterior kitchen door first shown in 1913 photographs. It is possible that the door and associated stoop were added after construction of the room.
④ Stoop added by 1913.
⑤ Brick lined cistern added by 1913, although it is suspect that it is of late nineteenth century construction.
⑥ Photographic evidence indicates that the window in the small Hunt Addition room, 112, was installed much later than construction of the Hunt Addition. The window is first shown in an 1872 illustration but cannot be seen in any photograph nor illustration thereafter.
⑦ Canopy roof constructed by 1913 over bare earth.
⑧ Hunt Addition chimney stack rebuilt in brick by 1880.
⑨ Gutters and downspouts added to the building by 1880. Gutters on the rear of the house fed the cistern in 1913.
⑩ Chicken House (HS-5) constructed or moved to present location prior to 1913.
⑪ The Stone Building roof and east wall collapsed and replaced prior to 1913.
⑫ By 1875 the top of the Ice House was replaced with the framed structure that now exists.



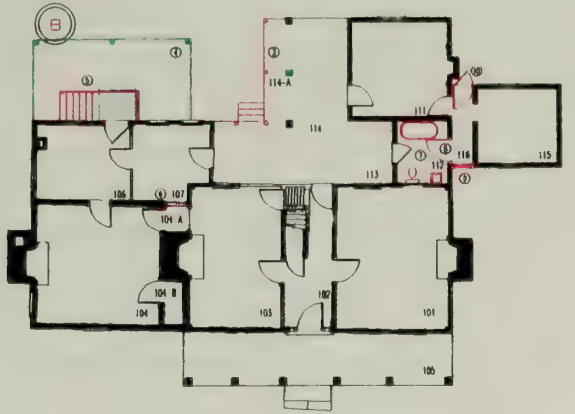
SITE PLAN
SCALE: 1/30" = 1'-0"

SHEET TITLE
HISTORIC BUILDING CHRONOLOGY
PHASE V: 1868-1913
WHITE HAVEN
ULYSSES S GRANT NHS
ST LOUIS, MO

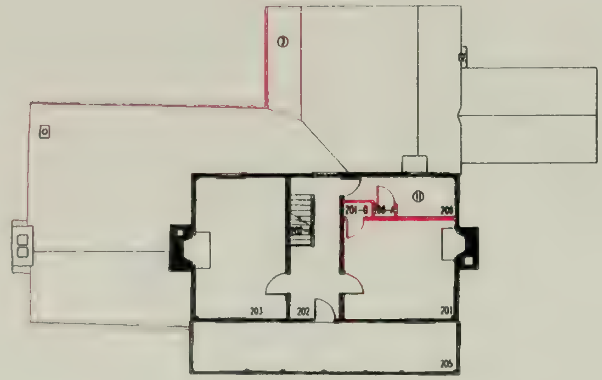
DESIGNED:		DRAWING NO. 357/80005
DRAWN K. R. WARDU L. M. JOHNSON TECH REV A. W. O'BRIGHT		AUTOCAD FILE WHCRFP05
DATE 8/30/93		SHEET 5 OF 7



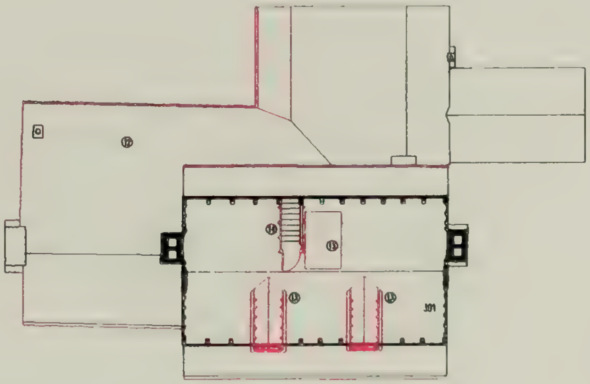
BASEMENT FLOOR PLAN
SCALE 1/8" = 1'-0"



FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"



SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"

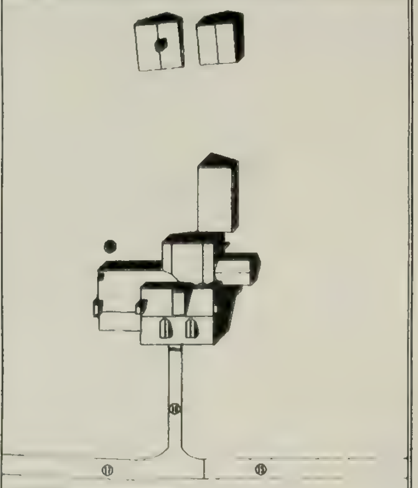


ATTIC FLOOR PLAN
SCALE 1/8" = 1'-0"

PHASE VI: 1913 to 1940
OWNERS: Albert and Emma Wenzlick (1913-1938)
Estate of Albert and Emma Wenzlick (1938-1940)

The house was in poor condition by the time Albert and Emma Wenzlick purchased the property in 1913. It is certain that some work performed by Albert was to stabilize and make the building habitable for use as a summer home. Principal modifications include demolition of the roof canopy, foundation replacement at the eastern half of the Long House, opening a circulation route between the East Wing and Hunt Addition, addition of Long House dormers, and installation of plumbing, central heating, and electrical systems. Shutters on the house at the time Albert purchased the property were removed and may have been reinstalled in the late 1920s or 1930s. The house was initially painted light gray by Albert, then white after that. Most of the following changes were made around 1915 unless noted otherwise.

① Crawlspace stone foundation replaced with concrete.
② Wooden pier front porch foundation replaced with concrete or stuccoed masonry wall.
③ Hunt Addition porch extended.
④ Canopy roof demolished.
⑤ Kitchen stoop replaced.
⑥ Door between rooms 104-A and 107 nailed shut and plastered over at the south face, the north face remained exposed. After 1940 the door was completely sealed within the wall.
⑦ Room 112 renovated as a bathroom.
⑧ Door added between East Wing hall and bathroom probably during this period.
⑨ Window closed off south end of East Wing hall.
⑩ Door enclosed north end of East Wing hall.
⑪ Bathroom and closets partitioned from second floor bedroom 201.
⑫ Eave rakes modified, and gutters, downspouts, and wood shingles installed on the roof.
⑬ Roof rafters cut or removed to install dormers on Long House.
⑭ Attic stair wall enclosed.
⑮ Driveway temporarily extended to Rock Hill Road during the 1920s.
⑯ Flagstones in walkway replaced around 1916.
⑰ Concrete slab placed over dirt driveway during 1920s.



SITE PLAN
SCALE 1/30" = 1'-0"

SHEET TITLE
HISTORIC BUILDING CHRONOLOGY
PHASE VI: 1913-1940
WHITE HAVEN
ULYSSES S GRANT NHS
ST. LOUIS, MO

DESIGNED

DRAWN
K. R. MARDU
L. H. JOHNSON
TECH. REV.
A. W. O'BRIGHT

DATE
8/30/93

DRAWING NO
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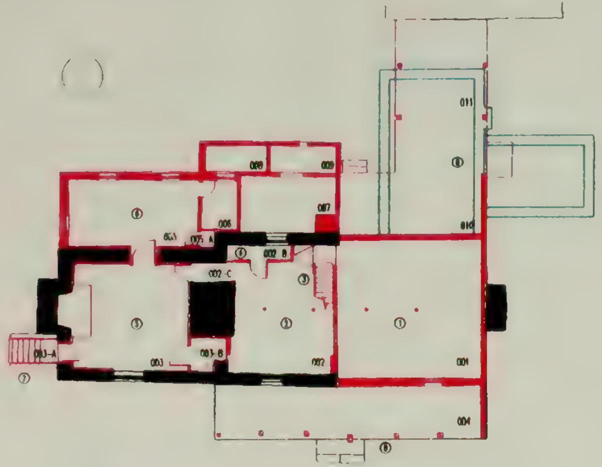
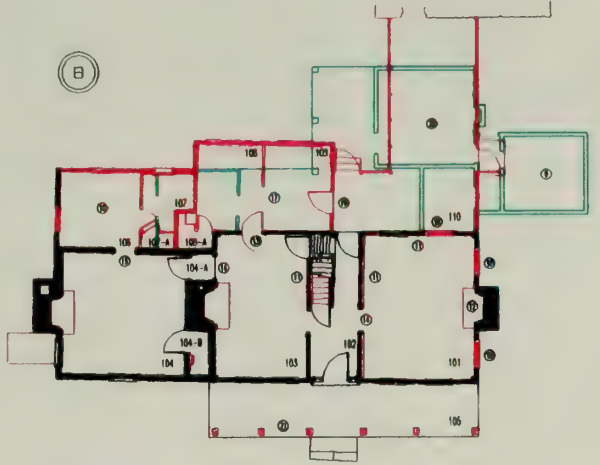
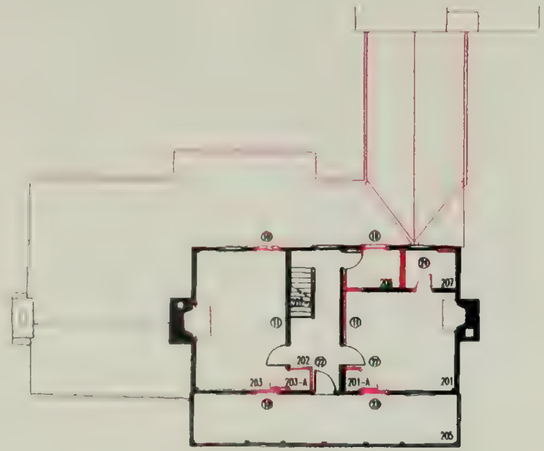
SHEET 6
OF 7



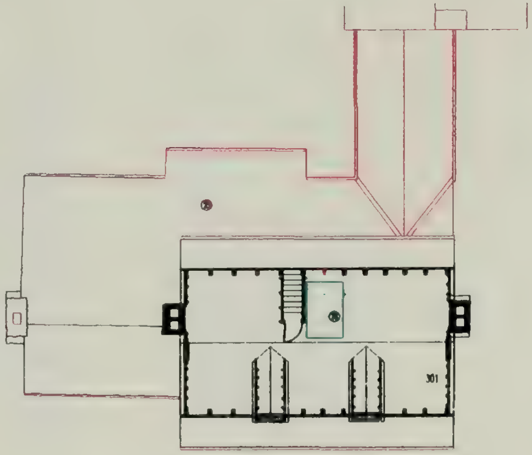
BASEMENT FLOOR PLAN
SCALE 1/8" = 1'-0"



FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"



SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"

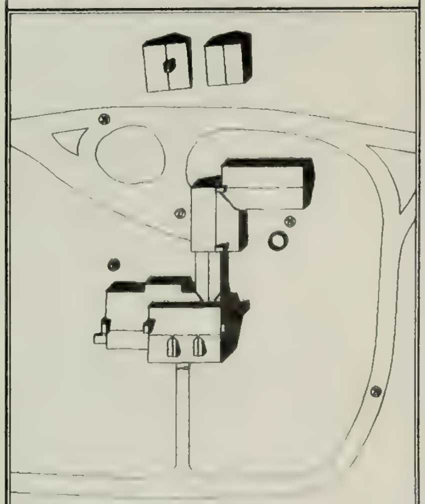


ATTIC FLOOR PLAN
SCALE 1/8" = 1'-0"

PHASE VII: 1940-1990
OWNERS: Delbert Wenzlick (1937-1979)
Heirs of Delbert Wenzlick's Estate (1979-1986)
St. Louis County/State of Missouri (1986-1990)

The house remained virtually unchanged since the last Dent and Grant modifications until Delbert Wenzlick acquired the property. He undertook extensive renovation work to modify the structure as a full-time residence. The alteration that most changed the historic integrity of the house was the total demolition of the Hunt Addition, East Wing, and North Porch. A breezeway was then constructed in the area of the Hunt Addition, joining the house to the Stone Building. A basement apartment was added in 1940. Six new windows were added to the historic core of the structure, and shutters salvaged from other buildings were installed. Much of the plaster finishes were replaced, and a furred floor finish was installed over the old board floors. Plumbing and electrical systems were modernized, and a forced air central heating and cooling system was installed.

① Basement room 001 deepened around 1952.
② Soil removed from basement room 002 in 1940 and concrete floor installed
③ Internal basement stair constructed 1940
④ Basement hall bath installed about 1940.
⑤ Floor and wall finishes added to basement room 003 during 1940s.
⑥ Full depth basement apartment added 1940
⑦ Cellar step-down stairs installed 1940
⑧ Front porch foundation replaced with concrete piers 1940
⑨ Hunt Addition, East Wing, and North Porch removed 1940
⑩ Window added 1940
⑪ Wall furred out 1940 to accommodate plumbing and mechanical systems
⑫ Chimney piece replaced 1940, and hearth replaced 1952.
⑬ Window removed and door leaf from 103 D3 installed 1940. South casing moved to this door from door opening in 1940 HABS Room 4
⑭ Door leaf removed 1940.
⑮ Door removed around 1940 and installed on Stone Building door opening D-2.
⑯ Walls and floors in Rooms 106 and 107 replaced and modified 1940
⑰ Kitchen added 1940 and expanded around 1950 to provide breakfast area.
⑱ Door removed and window installed 1940.
⑲ Door salvaged from old room 107
⑳ Breezeway constructed 1940 and expanded to join house to Stone Building around 1950
㉑ First floor porch posts replaced with posts of similar appearance 1940.
㉒ Closet installed 1940
㉓ Window sash installed from demolished window in room 108
㉔ Albert Wenzlick bathroom divided into two bathrooms 1940.
㉕ Asbestos cement roofing and copper gutters installed 1940.
㉖ Shed-roof dormer removed and missing rafter replaced 1940.
㉗ Stone Building renovated as garage 1950.
㉘ Workshop and associated cooling pond constructed 1950
㉙ Asphalt paved driveway extended to Whitehaven Drive 1940s
㉚ Asphalt paved driveway extended to the rear of the house around 1950



SITE PLAN
SCALE 1/30" = 1'-0"

SHEET TITLE
HISTOIC BUILDING CHRONOLOGY
PHASE VII: 1940-1990
WHITE HAVEN
ULYSSES S. GRANT NHS
ST. LOUIS, MO

DESIGNED
DRAWN
K. R. WAROLF
L. M. JOHNSTON
TECH REV
A. W. O'BRIGHT
DATE
8/30/93

DRAWING NO.
357/80005
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SHEET 7
OF 7

BUILDING DESCRIPTION

The principal structure of the site, locally described as a Missouri "plantation," features a two-story main block with a single story West Wing oriented east/west. Overall, the house is simply decorated. The front of the house faces in a southeast direction toward Gravois Road. The two story section of the house, or the Long House, was constructed in 1818 and measures about 20 feet by 36 feet. The front of the house features a two-story covered porch recessed beneath the core roof with irregularly spaced columns; perhaps the most unusual distinguishing character as one approaches the house. Other additions include a mid-nineteenth century construction off the north side of the West Wing, a twentieth century kitchen built north of the two-story portion of the house, and a breezeway addition, joining the garage to the house, built during the 1940s and 1950s.

The Long House is of braced frame timber construction of English derivation, using forms that date to the European middle ages and eventually carried over the Atlantic Ocean to New England. The interior plan of the Long House features a central stair case flanked on each side by a single deep room at both floors. However, the second floor symmetry has been compromised by the addition of closets and dividing walls built during the twentieth century. The West Wing is vertical log construction attributed to the French Colonial period of influence in the Mississippi River Valley during the eighteenth and into the early nineteenth century. The foundation is of rough-cut uncoursed stone, cast-in-place concrete, and concrete block. The house is sheathed in hand- rived and machine- beveled clapboard wood siding. Most of the windows are multi-light double hung, and flanked by exterior shutters.

The Long House is flanked by large exterior gable end limestone chimneys centered at the east and west walls of the interior spaces to which the fireplaces serve, but offset with respect to the side-gabled roof ridges. A stone chimney is also present at the west end of the West Wing. The three stacks are significant character defining elements in the appearance of the Main House. Their form, style, use of locally available material, and workmanship technique all exemplify traditional architecture prominent in the St. Louis area during the early nineteenth century.

The front entry, and first floor windows and porch posts are slightly asymmetrical with respect to the south facade as a result of early eighteen century modifications. The Greek Revival entry opens to a central stair hall flanked by parlors. The West Wing must be accessed through the west formal room at the ground floor of the Long House over a single riser. Each of the principle living areas, including the West Wing, features a stone fireplace. The West Wing basement features a large stone cooking fireplace and unbarked ceiling beams. This space a surviving rare example in the Missouri and Illinois region of kitchen facilities within a basement space.

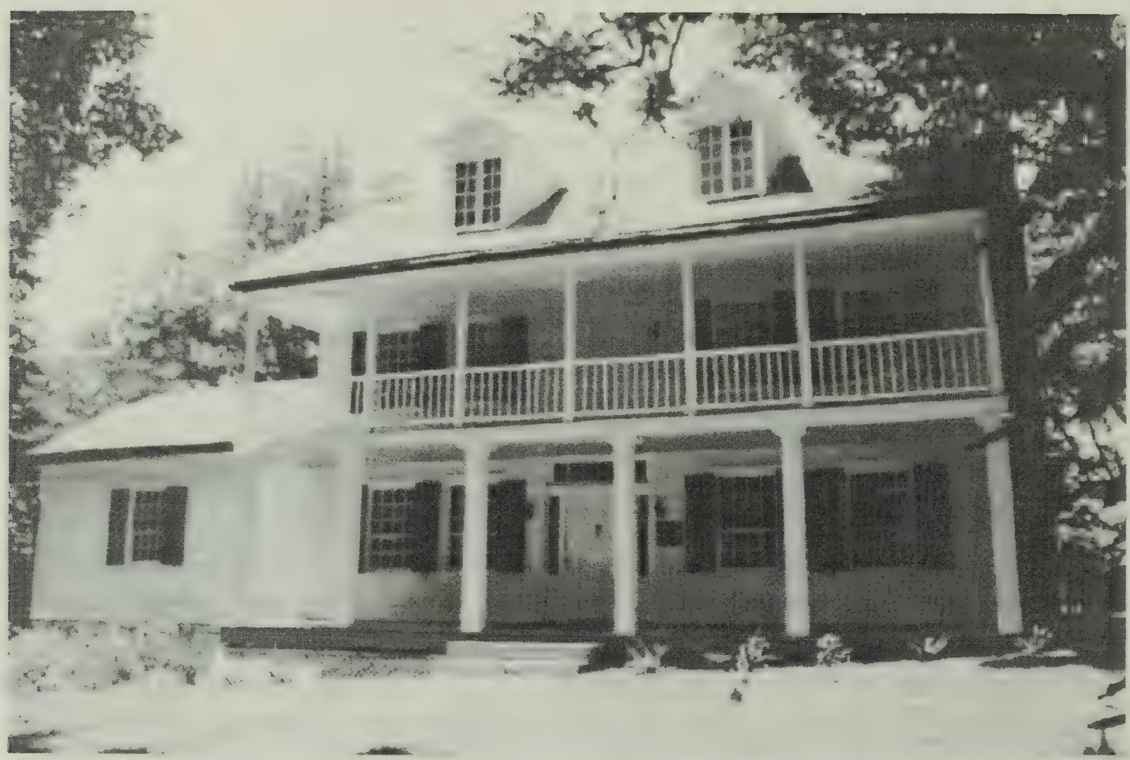

Figure 2.59 - Main House south exterior elevation, 1991. (Photograph by the author, ULSG collections).

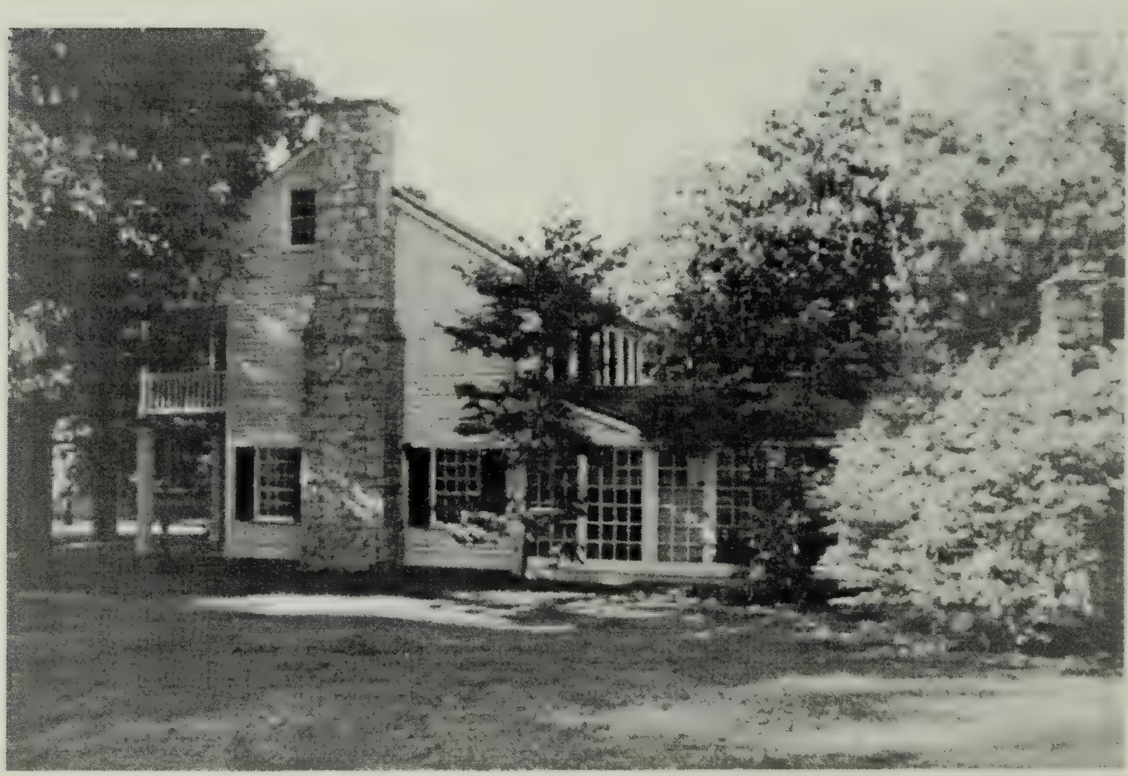

Figure 2.60 - Main House east exterior elevation, 1991. (Photograph by the author, ULSG collections).

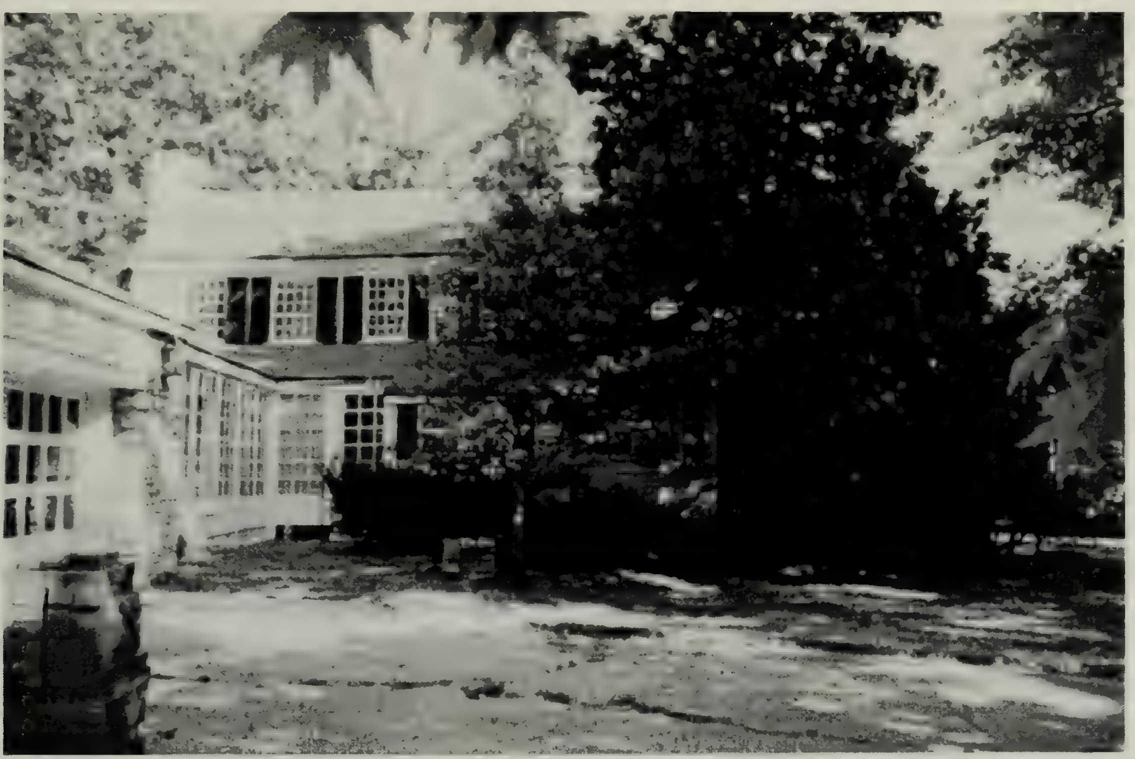

Figure 2.61 - Main House north exterior elevation, 1994. (Photograph by the author, ULSG collections).

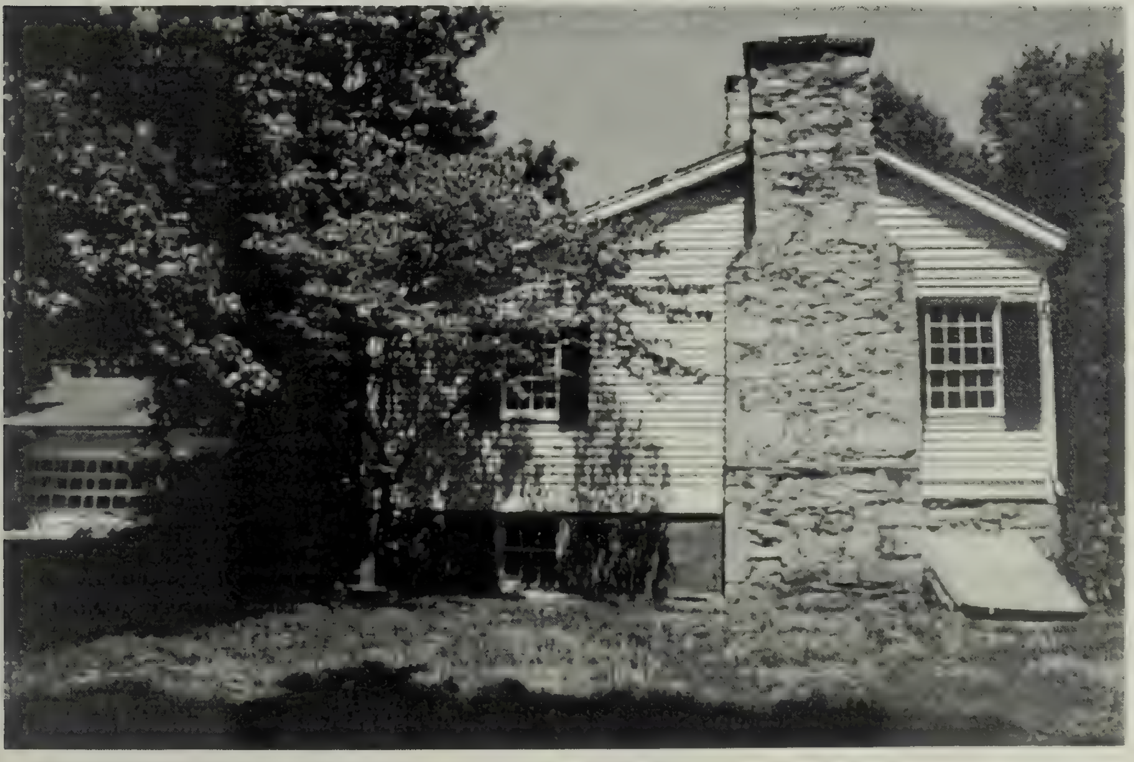

Figure 2.62 - Main House west exterior elevation, 1994. (Photograph by the author, ULSG collections).

MATERIALS ANALYSIS

Wood

Fifty-five wood samples were removed from structural members, windows, doors, sheathing, floors, and millwork, and seven samples from wood lath in the house during 1991 and 1992. Fifty-two of the wood and all of the lath samples were analyzed for specie by the Forest Products Laboratory, Madison, Wisconsin. The purpose of this analysis for the house was to comparatively date early building construction episodes in association with other information, determine specie which is important in structural loading analysis, assist in the identification of 1940 renovation work, and ensure compatible species are used in the repair of millwork. The results of the analysis can be found in Appendix A - Wood Identification.

Dendrochronology and Radiocarbon (C_{14}) Tests

A dendrochronology study, or wood dating test, was performed for St. Louis County Park and Recreation Department in 1987 in response to questions raised about the construction date of the West Wing. In an attempt to verify the dendrochronology study, the National Park Service initiated a radiocarbon (C_{14}) test during 1992 and 1993. Refer to Appendix B - Wood Dating for specific information on each of these tests.

Mortar

Thirty-one mortar samples were taken from Main House historic masonry work in 1992. These samples were analyzed for constituent materials and proportional mix by Architectural Conservator David Arbogast during May and June 1992. The purpose of the analysis was to comparatively date early building construction episodes through variances in materials and mix, and develop a repair mix compatible with existing mortars. Specific information concerning results of the mortar analysis can be found in Appendix C - Mortar and Plaster Analysis, and the Foundation Systems analysis of this Division.

Plaster

Eighteen plaster samples were taken from the Main House wall and ceiling finishes in 1992. Architectural Conservator David Arbogast analyzed ten of these samples for constituent materials and proportional mix during May and June 1992. The purpose of the analysis was to determine the extent of original plasters, and determine a compatible mix for repair work. Specific information concerning results of the plaster analysis can be found in Appendix C - Mortar and Plaster Analysis, and the Room Finish Survey of this Division.

Paint

A comprehensive paint analysis was performed on exterior and interior painted surfaces of the Main House in 1992 and 1993 by Washington University Technical Associates (WUTA). Later, several additional samples were analyzed by conservator David Arbogast. The purpose of these analyses was to comparatively date early building construction episodes in association with other information, determine historic colors, and assist in the identification of 1940 renovation work. Over 600 paint samples were removed from the interior and exterior of the house to accomplish these goals. Paint chronology information on specific building elements or systems is included within the related sections of Fabric Analysis.

There are two known color markers associated with the history of the house. The first marker occurs in a recollection prepared in 1908 by Emma Dent Casey on how the house appeared to her during the nineteenth century:

> The house itself was a pleasant, rambling old place, painted white and with big double porches running the full length of the front.[159]

The "white" she describes may be a cream or light beige color detected as the first finish applied to the exterior of the house. This finish was apparently extant at the time a photograph was taken of the house around 1860 (Figure 2.3). When HABS Room 4 was added to the northwest corner of the house, siding from that addition concealed a large portion of the West Wing siding at the west elevation. Analysis of that underlaying siding indicates that it had been painted the cream color.

Ruth Wenzlick Abbott, daughter of former owner Albert Wenzlick, recalled that the "...house was painted dark green inside and out" when Albert acquired the property in 1913.[160] The exterior paint finishes were said to be in very poor condition at that time.[161] In the paint analysis, a medium green and dark green were identified on many of the samples. Door 108A-D1 and a portion of the West Wing siding found encased within the wall cavity of Kitchen Closet 108-A, constitute the only large exposed surface areas painted in a two-tone green combination. The exposed surfaces are in good condition and are believed to have survived since the late nineteenth century, sheltered by an enclosed portion of a porch prior to encasement within the wall cavity. The question arises as to when the two-tone green paint was applied to the house.

In an 1883 photograph of the Main House, a fair amount of exterior siding and trim work surrounding the front door is shown (Figure 2.8). There is a definite difference in value between siding and trim surfaces seen in the photograph. For instance, the porch post capitals are much darker than the post shaft. This difference is also seen in the 1890 Boehl photograph (Figure 2.11), and with the siding surfaces exposed in Room 108-A.

Paint analysis has shown that the entire exterior of the house including siding, doors, windows, and casings was uniformly painted a medium grey (between Munsell N6 and N7) prior to the application of the green scheme. There would be little or no value differences between painted surfaces in a black and white photograph assuming that all similarly colored surfaces were photographed at uniform light levels. Therefore, it is assumed that the structure was painted in two tones of green by 1883, or at least two years prior to Grant relinquishing the property; a novel circumstance for a place deemed White Haven.

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[159] Casey, *Grant*, 1.

[160] Marjorie Felice letter to Save Grants White Haven, Inc., 19 March, 1986, ULSG files.

[161] Bill Wenzlick to the author, 30 November, 1992.

Ledger entries from a nearby store, owned by Jacob Wohlschlaeger, which supplied merchandise to the Grant farm may shed light on the precise year that the house was painted green. The following items were purchased:

May 16, 1874	1# Paris Green	40
June 13, 1874	2# Paris Green	120
	1# Sulpher	25
	5 Gall Oil	100[162]

Paris green is an extremely toxic, arsenic-based compound used as a paint pigment during the nineteenth and early twentieth centuries by house painters who typically mixed their own paints.[163] Also known as Scheele's Green, the name "Paris Green" is believed to have been derived from an incident which occurred in Paris, France, during the 1830s when several people were apparently poisoned ingesting bonbons colored with the chemical.[164] Two paint chips in *The Painter's Handbook* representing the pigment Paris green are indeed quite brilliant. One of the sample chip colors is almost identical to the light green siding paint layer found on the Main House.[165] The dark green found on trim throughout the interior and exterior of the house and black paint found on some cornice trim could have been derived by adding sulphur, or a number of other compounds, to the Paris green.[166] However, sulphur is indicated in the store ledger with the Paris green.

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[162] "Regular Account Book No. 9," kept by storekeeper Jacob Wohlschlaeger, Sappington, Missouri, 1874, 145 and 185.

[163] B.S. Mills, *The Painter's Hand-Book: Containing Information as to Color Harmony, the Properties of Colors, Practical Rules for the Mensuration and Preparation of Work...* (Cincinnati, Ohio: The Eckstein White Lead Co., 1887), 59. Paris green is described as "very brilliant, but is a poisonous pigment and most tantalizingly transparent and without body." Shirley Forster Murphy (editor), *Our Homes, and How to Make Them Healthy* (London: Cassell & Company, Limited: 1883), 368-372. The author of the chapter on "Arsenic in Wall-Papers and Paints" graphically describes the symptoms and effects of interior arsenic finishes on the human condition. Numerous incidents are documented of people poisoned merely from sitting in rooms finished in arsenic pigmented paint or wallpaper. Drs. Winckler, Elsner, Heintze, et al, *The Techno-Chemical Receipt Book: Containing Several Thousand Receipts, Covering the Latest, Most Important and Most Useful Discoveries in Chemical Technology, and Their Proctical Application in the Arts and the Industries*, edited and translated by William T. Brannt and William H. Wahl (Philadelphia: Henry Carey Baird & Co., 1888), 268. The pigment "...works badly under the brush, and covers badly; but its color is so brilliant that all other greens become dingy brown in contrast with it..." F. Maire, *Modern Painter's Cyclopedia* (Chicago: Frederick J. Drake & Company, 1918), 127. Paris green "...is a very poisonous arsenical product. It is very transparent and only fit to glaze with . It should be discarded entirely." Jeffrey R. Stewart, *The National Paint Dictionary* (Washington D.C.: Stewart Research Laboratory, 1948), 436. Chemically known as copper acetoarsenite, the pigment is highly toxic and probably no longer used in the paint industry. Martin L. Wolf, *Dictionary of the Arts* (New York: Philosophical Library, 1951), 244. The pigment Paris green is so poisonous that by the second half of the twentieth century it was used as an insecticide under the same name.

[164] Andrew Ure, *A Dictionary of Arts, Manufactures, and Mines; Containing a Clear Exposition of Their Principles and Practice* (New York: D. Appleton & Company, 1842), 1100-1101.

[165] Mills, paint chip 82. Described as "light emerald green," the recommended mix contains only Paris green and white lead pigments. Chip 89, described as "emerald," is slightly deeper in color.

[166] Wolf, 244. "...it can be blackened by sulphurous pigments." Mills, paint chip 12. Although paint chip 12 indicated in Mills is not as dark as the trim paint found on the Main House, lamp black, ultramarine, green and white lead pigments form a medium dark green.

It is possible that the above paint materials could have been used on structures other than the Main House. Wish-ton-wish, the house in which Grant stayed while visiting St. Louis, was an unpainted stone house that burned to the ground in 1873.[167] Barns and other outbuildings are believed to have been painted in traditional red; green paint was not found on any of the remaining three historic outbuildings. Hardscrabble was constructed of logs and was not painted.[168]

The ledger indicates that five gallons of oil were purchased with two pounds of Paris green. While it cannot be confirmed as to what type of oil it was (eg. lamp, cooking, linseed), five gallons would have been just about enough at that time to cover the entire house with one coat of paint.

Determination of when the green paint was applied is significant in that the green layer can be used much like a geologist uses rock strata to relatively date geologic events. In the case of the Main House, the green layers have been used to determine which elements have historic integrity with respect to pre-Grant ownership and modification of the house, assuming, of course, that there has only been one application of green paint. Therefore, much of the determination of historic integrity of individual elements in this Division is based upon this reasoning.

One contemporary color marker included the avid use of off-white or cream by Albert and Delbert Wenzlick for practically all interior and exterior surfaces except for shutters and porch decks. The use of cream or off-white began upon completion of the 1940 renovation work. If only several successive layers of white paint were found on a piece of millwork, the piece was assumed to have been installed during Wenzlick ownership. In some instances it was found that paint had been stripped from millwork. In these case other evidence, such as wood identification or the presence of cut nails, was used to determine relative age of questionable pieces.

A surprising aspect with regard to the paint analysis is that only three coats were applied to the Main House during its first 100 years of existence into the twentieth century. This revelation either speaks of the lasting quality of lead based paint, or the general disregard for maintenance on the house. The spare application of paint had an effect on some paint samples in that some layers were very deteriorated, probably due to long-term effects of weather exposure. Not until the twentieth century was paint routinely applied by the Wenzlick family.

Wallpaper

Bill Wenzlick donated four sections of what are believed to be historic wallpaper finishes to the park in 1992. According to Wenzlick, the donated samples had been in place somewhere in the house until extensive interior renovation work commenced in 1940 and most of the plaster finishes were removed from walls and ceilings. It was determined that the samples were removed from Room 103 between the chimney piece and Door 103-D3. The samples were sent to the Cooper-Hewitt Museum for analysis. Additional information can be found in Appendix E, Wallpaper.

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[167] "Big Fire - Grant's Farm in Flames," 23.

[168] The logs of Hardscrabble currently have a transparent green tint. However, it is believed that the color was derived from the application of copper-bearing wood preservative during the 1960s or 1970s, and not a conscientious attempt to paint the structure green.

Asbestos

In 1991 the St. Louis firm, ATC Environmental Inc., was contracted by the National Park Service to survey the extent of asbestos bearing materials at the site. The intent of the survey was to sample and analyze materials suspected of containing asbestos prior to commencement of any physical investigation or construction work. Materials sampled in the house included plaster, gypsum wall board, electrical, building, duct insulation, vinyl floor finishes, thermal mortars, caulks, and roofing materials. Of 97 analyzed samples the firm identified several asbestos-bearing materials in the house. Refer to Appendix G - Asbestos Survey for specific information.

Sub-Surface Soils Survey

Three soil bores were drilled around the house in July 1992, and a report on the results was submitted by Soil Consultants, Inc., of St. Peters, Missouri. In summary, two test holes reached refusal at limestone between 13 feet and 15 feet in depth, and no ground water was encountered. For specific information on test results and foundation design recommendations refer to Appendix H - Sub-Surface Soils Survey.

Lead

No tests have yet been made of lead content in existing paint finishes and soil surrounding the house. It is assumed that lead is present in paint that was applied to interior and exterior surfaces of the house since prior to 1977, although the percentage content of lead is unknown. It is also assumed that surfaces painted green throughout the house contain arsenic-based pigments (see Materials Analysis, Paint).

ARCHEOLOGICAL SURVEY WORK

Two archeological investigations and site shovel survey tests were initiated during the summers of 1991 and 1992, and remote sensing tests were carried out in 1992.[169] Additional pits were excavated in 1993 in response to anomalies detected by the non-destructive testing. No other professional archeological work is known to have taken place on the site. The following summarizes the architectural finds.

The first round of excavations on the Main House was concentrated on locating subsurface remains of the Hunt Addition and East Wing, at the exterior of the east and west chimney stacks, and at the edge of the front porch. In limited test pits no substantial remains were found of the Hunt Addition and East Wing. Apparently, the stone foundations were almost completely removed during or after the 1940 Wenzlick demolition work. The stone that remains from the foundations and the Hunt Addition fireplace are scattered.

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[169] Remote sensing included the use of proton mognetometry and soil resistivity testing.

A test pit at the east chimney stack confirmed the depth of the original stone foundation, and that the stack is canted inward toward the basement below grade level. A pit at the west chimney stack concluded at about 3 feet below grade. The excavation only revealed that the east and west stack foundations differed in construction technique.

A small test pit was excavated at the edge of the front porch, just west of the stone steps and below one of the second floor porch posts, to investigate the existence of stone pier remains from the original first floor porch posts. No pier was found, but remains of a stone wall which supported the porch were evident.

In June of 1992 excavations commenced in the West Wing basement to locate the original floor level. A section of wood strip floor and framing, a concrete sub-slab, and a contemporary brick hearth were removed prior to the excavation. The excavation confirmed the original depth of the soil floor, the depth of the stone foundation, and the existence of original stone hearth remains. A small test pit in the basement furnace room yielded the depth of the foundation along the south wall.

Shovel testing, magnetometer, and soil resistivity survey efforts were concentrated away from the Main House 1991, 1992, and 1993, and had no direct bearing on the house.

Archeological excavations were performed in April 1995, on the north edge of the Hunt Addition, the exterior south elevation of the West Wing, and the floor of basement Room 003. No formal was completed at this writing, but enough is known about the excavations to offer brief observations. Remains of the Hunt Addition north foundation wall, and a flagstone walk and stone curb between the Hunt Addition and Stone Building were found. In Room 003, soil stains indicated that the floor consisted of wood planks over timber sleepers. Preliminary analysis of artifacts indicated that the plank floor was in place by around 1840 but removed approximately fifteen to twenty years later in favor of a sand/gravel/dirt floor.[170]

SITE CONTEXT

Grade and Drainage

The surrounding grade follows the long axis of the house, uniformly falling approximately 4 feet from the east to the west side of the building. Archeological investigations and nineteenth century photographs reveal that there has been very little rise in the soil level around the building since its initial construction. However, the soil level has encroached the sill at basement Window 003-W1.

Present drainage around the house is fair to poor. Although the overall topography slopes away from the west end of the building, water has been observed on several occasions that water collects in basement Rooms 001 and 003 during and after heavy rains. In room 003 water follows a path adjacent to the west chimney stack and enters at the back of the firebox. The water level recedes within three days through a drain hole in the concrete subfloor of that room and through percolation through an archeological pit. At times the water must be pumped from the pit. Heavy sediment on top of the concrete subfloor indicates that this condition has persisted for some time. The construction of the wooden framed floor over the concrete floor in room 003 may have in fact been an attempt to provide a dry floor surface in that space while conceding entry of water.

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[170] Archeologist James E. Price to the author, 18 May, 1995.

Brick troughs mortared in place at the east and south elevations near the front porch and semicircular clay pipe sections placed at the west elevation at the ground level may be an indication that basement water infiltration has been a recurring problem. Although the effectiveness of the troughs is dubious since they are placed at the gable ends of the roofs, the troughs may have been an attempt to stem the flow of water into the basement areas. The troughs were probably installed during Delbert Wenzlick's ownership. Groundhog borrows beneath the front porch directs rain water into basement Room 001. Water gushed through breaks in the east and south concrete block walls during heavy rain in 1993.

A cistern at the northwest corner of the house is constructed of brick with a parge coat of mortar at the exterior exposed area, and capped with a concrete slab. One inlet can be seen entering at the southwest interior but it is unknown if any other inlets exist as the cistern is filled with contemporary midden. It is unknown at this time whether the cistern is affecting house foundation drainage.

Soils

The soils are generally described as 5 feet to 10 feet of medium-stiff to very stiff, low plastic, silty clay overlying a layer of medium-stiff to very stiff clays and weathered rock. Bedrock lies approximately 14 feet below grade in the area surrounding the house.[171]

Vegetation

Vegetation consists of a variety of tree and shrub species planted since the 1940s. Yew shrubs were cut above the grade at the south elevation in the Fall of 1990 as they had become extremely overgrown and hindered scheduled archeological investigations and building maintenance. Two large, decayed trees were removed from near the southeast and southwest corners of the house in Spring of 1991 when it was determined that they posed a threat to the house and personnel. A large magnolia tree near the north elevation is in good condition and does not appear to be a threat to the house except for the possibility of lightning strikes. The limbs of an oak tree at the southeast corner overhang the house roof.

In the Summer of 1991, lightning struck a sweet gum tree during a violent thunder storm. This tree grew adjacent to the east elevation of the breezeway and was knocked to the Stone Building roof, causing little damage to the roof but destroying the tree.

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[171] Soil Consultants, Inc., *Exploration of Subsurface Conditions and Foundation Recommendations-Ulysses S. Grant National Historic Site-Grantwood Village, Missouri* (August 3, 1992), 4.

Soil Treatment

The house has been treated for termites several times since about 1940.[172] The specific chemical used for these treatments is unknown, but it is suspected that chlordane was used as it was the favored chemical until its prohibition during the 1980s. Bill Wenzlick stated that termite treatment was the reason for the cutting of the south section of breezeway deck to gain access to soils surrounding the north foundation wall. In addition, Bill Wenzlick stated that soil treatment was supplemented by boring into structural members and poring the chemical into the holes until the wood was saturated. Soil beneath the breezeway may have been treated by pouring chemicals directly onto the soil surface.

FABRIC SURVEY

Foundations

The existing foundation is constructed of three materials: limestone, cast-in-place concrete, and concrete block, the former two attributed to nineteenth century construction. Original 16 inch to 20 inch thick stone foundations occur at the west half of the two story portion and at the West Wing. The stone is a buff to yellow medium grained limestone and was probably quarried at the exposed bedrock banks of the Prairie Spring just north of the house.

Detailed analysis reveals that bed mortars in all stone foundations and chimney stacks are composed of soil with little or no lime content.[173] The early masons of the house simply shoveled up soil from the surrounding site or used excess builders trench soil to lay up the stone. The reason soil bed mortar was used in lieu of sand and lime mortar is unclear in this instance, although eighteenth century St. Louis masons apparently embraced the use of soil mortar in masonry protected from the effects of weather.[174] The use of soil mortar is usually explained by the unavailability of lime, but limestone was a easily obtainable commodity in the St. Louis region.[175] The limestone merely had to be quarried and burned to reduce it to lime. Lime had been produced in St. Louis since the mid-eighteenth century so there appears to be no shortage of the material. Perhaps the owners had an economic hardship obtaining lime, and used it only for the pointing mortar that was exposed to the weather. The other possibility for the use of soil mortar was the difficulty in obtaining suitable sand. White Haven is in close proximity to streams and rivers, but sand banks may have been of insufficient quantity or contained impurities such as mud and organic matter.

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[172] Bill Wenzlick to the author, 24 February, 1992.

[173] David Arbogast, *Mortar Analysis, Ulysses S. Grant National Historic Site* (Iowa City, Iowa: May, 1992). 4-6 (hereafter cited as Arbogast, *Mortar Analysis*).

[174] Charles E. Peterson, *Colonial St. Louis, Building a Creole Capital* (Tucson, Arizona: The Patrice Press, 1993), 39-41 (hereafter cited as Peterson, *St. Louis*).

[175] Harley J. McKee, *Introduction to Early American Masonry, Stone, Brick, Mortar and Plaster* (Washington D.C.: National Trust for Historic Preservation, 1973), 61 (hereafter cited as McKee, *Masonry*).

Although soil mortar has the ability to bear heavy loads, the masons must have recognized that soil mortar rapidly deteriorates when exposed to rain and high humidity levels especially found in eastern Missouri.[176] The masons at least had the forethought to point the joints with a refined mortar consisting of one to three parts lime and one to four parts sand.[177] The stone joints are pointed to a depth of between 1½ inches to 2 inches from the face of the stone (Figure 2.63).

Evidence of the use of sand and lime pointing mortar could not be found on sub-grade surfaces of the east and west chimney stacks.[178] Perhaps the masons felt that sub-grade work would be subjected to moisture, regardless of the installation of good pointing work, and therefore did not want to waste precious lime. The absence of sand and lime mortar in all below-grade foundations in contact with earth should be anticipated.

Excellently preserved examples of raised mortar joints original to the two story portion of the house can be seen on the central chimney stack in the basement and the West Wing attic (Figure 2.63). A very small section of original flush joint work was found in the West Wing basement just east of the sill of Window 003-W1. All other stone joint work has eroded, been removed, covered by later repointing efforts, or concealed by later constructions.

Structurally, the remaining stone foundations are in fair but stable condition. Settlement has occurred as evidenced by unplumb walls and unlevel floors throughout the first floor. Archeological test pits revealed the depth of the full basement stone walls in Rooms 002 and 003. The concrete floor along the south wall of Room 002 extends between 3 inches and 4 inches beneath the stone foundation. This indicates that the foundation walls of this room, and possibly others, may have

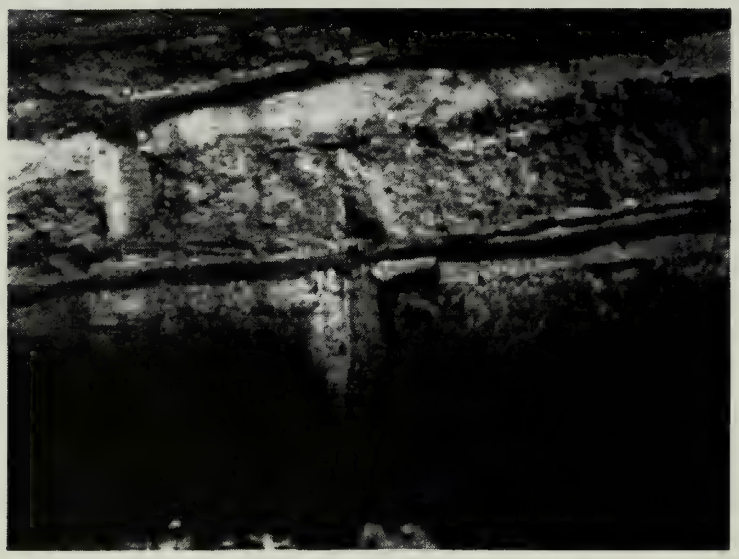

Figure 2.63 - Center chimney stack original mortar joint work, 1994. Although soil based bed mortar was used for all masonry in the Long House and West Wing, sand lime mortar was used to apply a raised, pointed finished joint. This sample was photographed in basement Room 003 behind first floor framing. (Photograph by the author, ULSG collections).

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[176] McKee, *Masonry*, 61.

[177] Arbogast, *Mortar Analysis*, 1-3. Samples M-204-12, M-003E-16, M-002S-21, and M-002N-24.

[178] There was no evidence of sand and lime mortar during 1991 archeological excavations of the east and west chimney stacks.

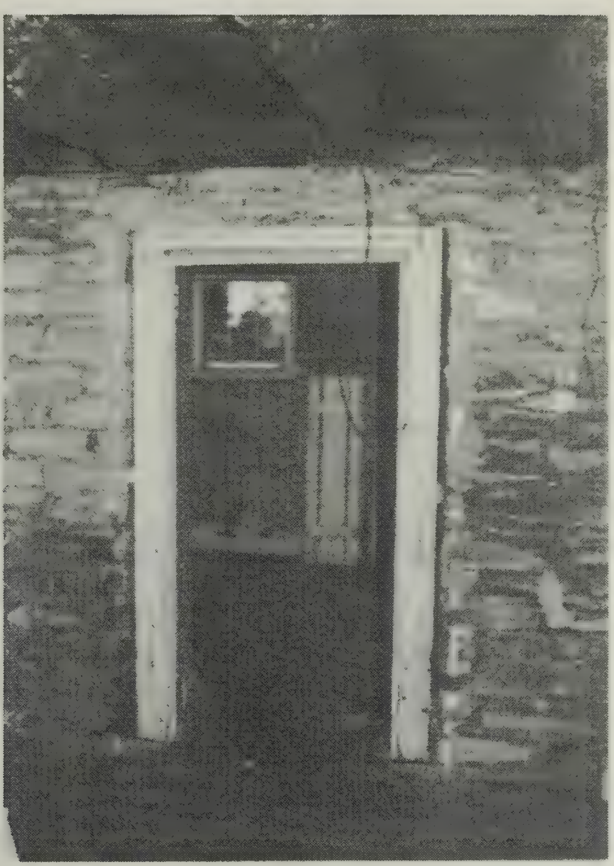

Figure 2.64 - Doorway 005-D1, 1994. This opening was cut through the stone foundation wall to create a passage between West Wing basement Room 003 and a basement apartment constructed in 1940. (Photograph by the author, ULSG collections).

been undercut in 1940 to afford a lower floor level, and thus, more headroom in this space. The south wall of basement Room 003 exhibits a slight, inward bulge due to soil and hydrostatic pressure. Evidence of patched cracks exist at the exterior south elevation of the this room. All stone foundation walls are unreinforced, and therefore, have very low resistance to earthquake forces.[179] Most spot deterioration appears to have been the result of modifications by former owners. At the exterior cellar entry, stone is infilled above the door head (Figure 2.107). This replaced an original doorway which extended from the grade line to the underside of the foundation sill (Figures 2.3 and 2.14). Sometime during the 1940s the opening was deepened to accommodate the existing exterior stair to the interior cellar floor level, eliminating the need for interior stairs. Perhaps the owners believed that the stone infill provided a more finished appearance than wood. In any event, the infill work has settled possibly due to a weaken door lintel.

Door 005-D1 was cut through the West Wing foundation wall around 1940 to provide access to an apartment bedroom (Room 005) dug out of a crawlspace at that same time (Figure 2.64). The walls surrounding the doorway appear to be in stable condition although weak stone infill occurs above the door presumably for aesthetic reasons. The extent of original stone which has been displaced in the construction of the doorway is unknown. A full depth stone wall was also removed at the

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[179] HA, *Structural*, 7.

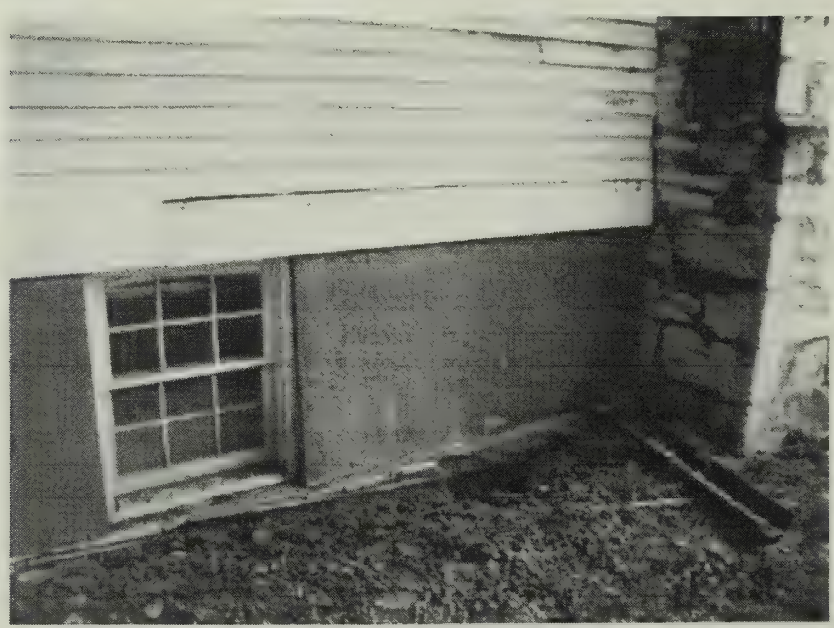

Figure 2.65 - Concrete wall at West Wing foundation, 1994. A five-inch thick concrete wall was poured against the west elevation masonry when the basement apartment was constructed in 1940. The wall extends from just below grade into the framed wall cavity. It is suspected that the concrete is bonded to the original foundation stone roughly between the window and the west chimney stack in this view. (Photograph by the author, ULSG collections).

northeast corner of Room 003, and a stone knee wall is believed to have been removed from the southeast corner of the same room. This work was performed around 1940 to provide access between the full basement areas.

Spot deterioration also occurs at the top of the foundation, particularly at the south elevation of Room 002C where stones have been removed and loosened so that utility lines could be passed into the kitchen wing. Throughout most of the West Wing basement Room 003, the top of the foundation wall has been beveled with a portland cement based mortar. There is also a void at the exterior of Room 003 along the south elevation. A five feet by ten inch section of face stone has either been removed or has deteriorated just below grade level in this area.

There is a portland cement based parge coat at the lower 3 feet of the south interior wall of furnace Room 002. This coat is extremely hard and tenaciously bonded to the base stone. Attempts to remove the coat damaged the stone. The reason the coat was applied is unknown.

A 5 inch thick concrete wall was placed against the original stone foundation at the west elevation just north of the chimney stack (Figure 2.65). The concrete was added during the 1940 Wenzlick modifications to the HABS Room 4 which included deepening of the basement. It is suspected that this work was accomplished in this area to smooth the off-set transition between the adjacent kitchen concrete foundation and the stonework. A photograph taken in 1913 clearly shows that this area of foundation was exposed stone (Figure 2.14). The concrete wall extends from just below grade to within the wood frame wall cavities.

Former twentieth century owners attempted masonry repointing and repair work on numerous occasions. Various mixes and colors of portland cement based mortar have been, in most instances, haphazardly applied to the stone joints at exposed interior and exterior surfaces. In testing for removal it was found that most of this dense mortar can be removed by hand chisel with little

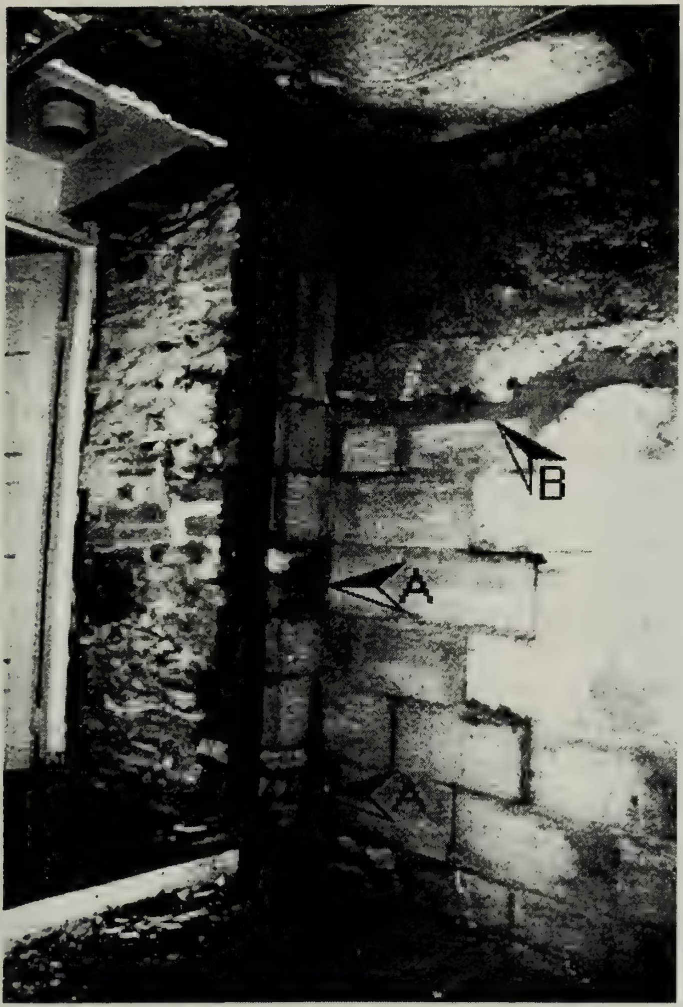

Figure 2.66 - Joint between foundation stone and concrete block masonry, 1994. This photograph was taken at the northwest corner of basement room 001. Projections of original stone (**A**) into the concrete block signifies that there may have been a stone retaining wall between Rooms 001 and 002. The cast concrete crawlspace foundation wall above the joint at **B** was poured around 1914. The concrete block below **B** was laid around 1950 to provide useable basement space. (Photograph by the author, ULSG collections).

damage to the original stone surface. The reason for this weak bond of portland cement mortar to the stone may be that the stone had not been properly cleaned and dusted prior to execution of the pointing work.

Basement Room 001 foundation is composed of cast-in-place concrete from the foundation sill to about one foot below grade, and then 8 inch concrete block for the remainder of the basement's depth. It is unknown if any of this is reinforced. Around 1914 Albert Wenzlick replaced original stone crawlspace foundation with cast-in-place concrete. The original foundation sill at the east and north interior elevations of Room 001 was also replaced with concrete (see First Floor Structural Plan). It is suspected that the concrete was also used to replace numerous stud ends in those areas seen in the 1940 HABS photograph taken of the east exterior elevation (Figure 2.25). This photo shows the studs resting at different levels on either side of the chimney stack. Termites and/or rot may have caused such severe damage in this area that Albert Wenzlick may not have had the resources or knowledge to make repairs in the traditional manner.

Concrete block was laid beneath the cast concrete during the 1950s when the area was deepened to a full basement for use as a model train room by Delbert Wenzlick.[180] This area is perhaps the most unstable portion of the entire foundation as it exhibits structural cracks, displaced blocks, and areas subject to water infiltration. It is suspected that these foundation walls are unreinforced. The east chimney stack is exerting pressure on the block wall, cracking it to either side of the stack.

Removal of finishes in basement Room 001 uncovered the joints between original stone and the concrete and concrete block walls at the north and south walls (Figure 2.66). No physical evidence remains verifying the depth of the original crawlspace walls. A large block of concrete poured at the north joint in the southeast corner of Crawlspace 007 appears to have been an attempt to buttress the joint externally.[181] The concrete buttress is severely undermined by rodent boroughs.

Full and partial cast-in-place concrete foundations support the areas of Rooms 106 and 107, and Kitchen 108/109. Figure 2.40 shows foundation work in progress during 1940 renovation of the old kitchen or HABS Room 4. The depth and extant of reinforcement of the foundations are unknown. There are no apparent structural cracks; overall these walls are in good condition.

The front porch is supported by 6 inch to 8 inch square concrete piers set about 6 feet on center. These piers are perhaps the second or third generation porch supports. In a circa 1883 photograph showing the front porch area (Figure 2.8), the porch was supported by a perimeter stone wall. Archeological investigations conducted in 1991 revealed scattered remains of a perimeter wall or pier in the bay just west of the porch steps. The existing piers are stable, but their depth below grade is unknown. It must be noted that the porch support lines do not follow from the second floor posts to the piers. The foundation piers and first and second floor posts are offset with respect to each other, causing a cascading flow of compressive forces from the porch roof to the ground.

The breezeway, constructed in two phases during the 1940s and 1950s, is supported by a combination of cast-in-place concrete piers and a stem wall at the east elevation. In addition, former building owners added concrete block supports at the midpoint of major structural members.

Structural Framing Systems

Construction Methods

The house exhibits a range of wood construction techniques. The selection of a specific construction technique with respect to this structure was dependent upon the builders' familiarity with a technique, availability of materials and labor, and period construction technology. Therefore, a

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[180] Bill Wenzlick to the author, 24 February, 1992. Bill Wenzlick indicated that this room was deepened during 1940 renovation work. However a newspaper found cast into the bottom of the replaced east fireplace hearth bore the date of 21 January, 1952. This indicates that the work started sometime after that date.

[181] The concrete buttress encases plumbing and electrical lines installed during the 1940 renovation work, further confirming that the deepening of Room 001 foundation postdated the 1940 work.

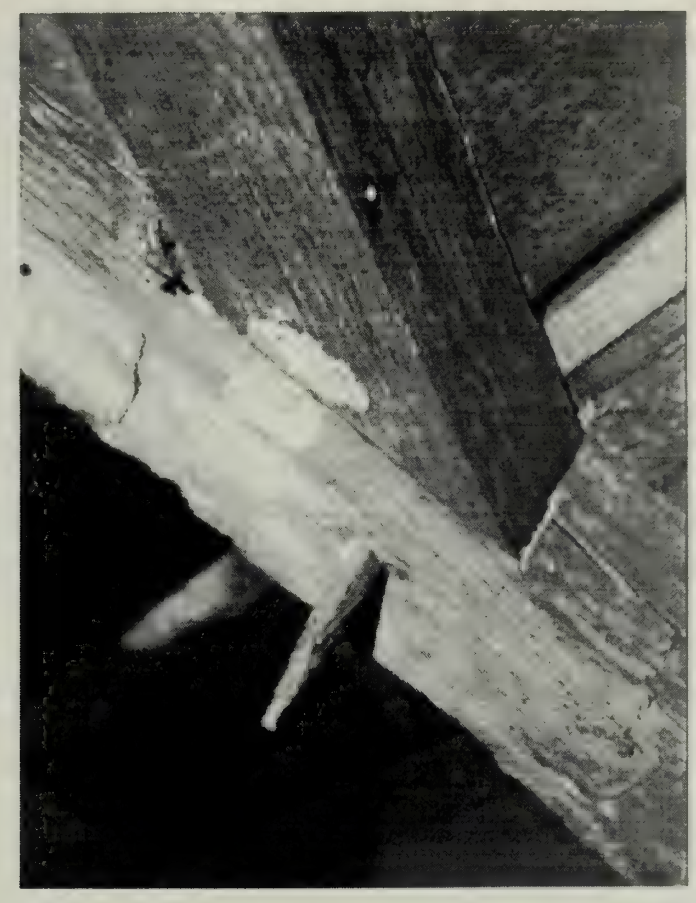

Figure 2.67 - Long House wind brace to rafter joint, 1994. Note the trenail pinning the joint. (Photograph by the author, ULSG collections).

building that has survived a long period of time through several owners usually exhibits a variety of construction techniques; such is the case with this house.

Although William Lindsey Long purchased the property in 1808, he did not begin construction of this portion of the house until around 1817. A 1987 dendrochronology study indicates that the felling date for Long House structural timber was about 1817; a 1993 radiocarbon (C_{14}) test was inconclusive for a single sample taken from a rafter in the house.[182] The Long House is constructed of post and beam construction with pit sawn 3 inch by 4 inch stud infill. The corner posts and one intermediate post measures 7 inches square.

Structural members are principally of white oak, hand hewn using pole and broad axes.[183] There is no evidence that an adz was used on any exposed structural members. All connections are made with mortise and tenon joinery fastened with trenails (Figure 2.67).[184] White pine and tulip poplar (Liriodendron) were found to be used in early renovation work completed around 1840.[185] While tulip poplar (or tulip-tree) is indigenous to Missouri, the closest white pine groves could only be found in northern Illinois. White pine was generally not available from the northern forests of Wisconsin and Michigan until the late 1840s.[186] However, white pine may have been arriving in St. Louis from Pennsylvania as early as 1819, transported by flatboats via the Ohio and Mississippi river systems. The raw lumber was subsequently whipsawed in St. Louis.[187] While it is possible that white pine could have been used for finish lumber in the Long House, it is doubtful that white pine was used for rough structural work until the 1840s because of the cost of that wood compared to the cost of indigenous lumber.[188]

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[182] *Guyette, Dating Report*, and Environmental Science & Engineering, Inc., *Ulysses S. Grant National Historic Site, St. Louis, Missouri, Phase VII: Dendrochronology Study* (St. Louis, Missouri: 1993). The hand hewn rafter was the only common sample (GRT-002) taken from the Long House and analyzed in these two tests as all other sample areas from the Guyette test are concealed by siding and therefore difficult to locate. However, Guyette determined a felling date of 1817 for all three samples from the Long House.

[183] Harry A. Alden, untitled wood analysis schedule for Ulysses S. Grant National Historic Site (Madison, Wisconsin: U.S. Forest Products Laboratory, August 19, 1992), samples W-204-08, W-101N-09 and 10, W-001C-43, and W-001N-44(hereafter cited as Alden).

The three structural floor systems vary somewhat in design from floor to floor. The first and second floors are laid out with perimeter sills or girts. Chimney girts straddle the transverse section of the building at the east and west ends. Fireplace hearths rest on these girts. A girt also spans the midpoint of the house adjacent to the east face of the stair. Summer beams bisect the building and are mortised or supported by the girts. Differences between the first and second floor systems include the use of unbarked log joists at the first floor and 2 inch by 7 inch hewn and pit sawn joists at the second floor. This difference was due to the builder's requirement to provide a flush surface for first floor ceiling finishes that unhewn logs could not provide. There is no physical evidence that first floor ceiling joists were ever meant to be exposed.[189]

Some first floor joists are quite different in material and workmanship when compared to other joists in the basement. In basement Room 001 there are three squared walnut joists. Surface marks indicate that these pieces were pit sawn. Why the builder chose to install squared walnut joists when all other timbers are round oak is speculative. There is no evidence that the walnut joists are replacement pieces. One advantage in the use of walnut is that the wood is insect resilient. Most of the existing basement oak timbers are peppered with powder post beetle burrows, yet the walnut remains virtually untouched by these insects.

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[184] Trenails (also tree-nails) are hardwood pins used to secure a mortise and tenon joint.

[185] Alden, samples W-101W-11 and W-101W-12.

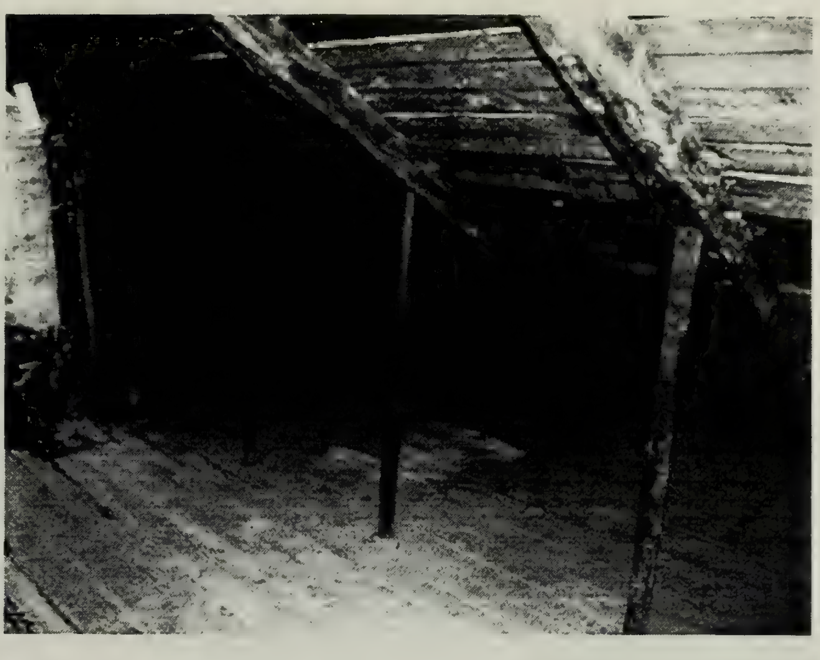
[186] Bernhard E. Fernow, "American Lumber," in Chauncey M. Depew, ed., *One Hundred Years of American Commerce, 1795-1895*, 2 vols. (New York: D.O. Haynes & Co., 1895), 197 (hereafter cited as Fernow in Depew, *American Lumber*). Fernow states that a boom containing logs broke on the St. Croix, a Wisconsin tributary to the Mississippi river. The logs were subsequently fashioned into a raft which was floated to St. Louis in 1843. Fernow continues that the incident "...seems to have given impetus to the growing log trade in that direction".

[187] Fernow in Depew, *American Lumber*, 197.

[188] Fernow in Depew, *American Lumber*, 197. According to price lists in Fernow's possession, the price of sawn boards from Pennsylvania were selling at $8.00 per 100 feet in 1819 in St. Louis. By 1858 the price had dropped considerably to $2.00 per 1,000 feet. Presumably he is referring to the standard board foot of measurement in his analysis.

[189] When the underside of a structural floor system was left exposed, timber surfaces were typically smooth finished with an adz. Sometimes the timber or underside of the floorboards were painted. There is no indication in the case of this house that any care was given to fine finish the underside of the floor systems.

Figure 2.68 - Long House attic toward the northwest corner, 1994. The slender oak posts transmit compressive forces from the rafters to the joist beams. The posts, which rest directly on the tongue and groove floor boards, are believed to be original to the construction of the house. (Photograph by the author, ULSG collections).



The attic floor system is quite different from the former floor systems in that 7 inch square beams span the entire depth of the building. The beams, spaced 39 inches on center, provide lateral support for the hewn 4 inch square red oak rafters which lay directly above the beams.[190] The rafters are slightly tapered apparently due to the tapering of the raw logs from which the rafters were hewn. The ridge beam is of unique workmanship in that four of its five faces follow the roof pitch and provide a setting surface perpendicular to rafter pitch. This detail required the builder to hew a beam into a diamond shaped cross section. Nowhere else in the house is such quality of workmanship found on a structural member. Ridge beam surfaces have been finished smooth with a plane. The attic floor/roof system is structurally supplemented by two rows of slender hewn red oak posts (Figure 2.68). The posts are fastened with cut nails to the underside of the rafters and the bases rest directly on the floor boards above the floor beams. There is no indication that these posts are not original to the construction of the Long House.

Inspection of tool marks at exposed structural member surfaces in the Long House indicate that at least two or more persons were responsible for hewing structural members. Pole ax marks on summer beams exposed in Rooms 001 and 002, perimeter beams, and the chimney girt exposed in Room 101 indicate that these members were scored by an experienced hewer. The score marks are spaced between 15 inches and 16 inches, and are vertically aligned. Tool marks on the summer beam and hewn joist surfaces in Room 101 indicate that the hewer may have had some skill in the technique, but not enough for his work to qualify as good craftsmanship.[191] The score marks are

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[190] Alden, sample W-301N-31.

[191] For a hewer to be considered an expert, score marks from a pole ax will align vertically and be uniformly spaced across the entire length of the timber. In this case the score marks are quite erratic. Bernie Weisgerber, Regional Historic Preservation Specialist, Region One, U.S. Forest Service to the author 17 June, 1992, during a preservation workshop.

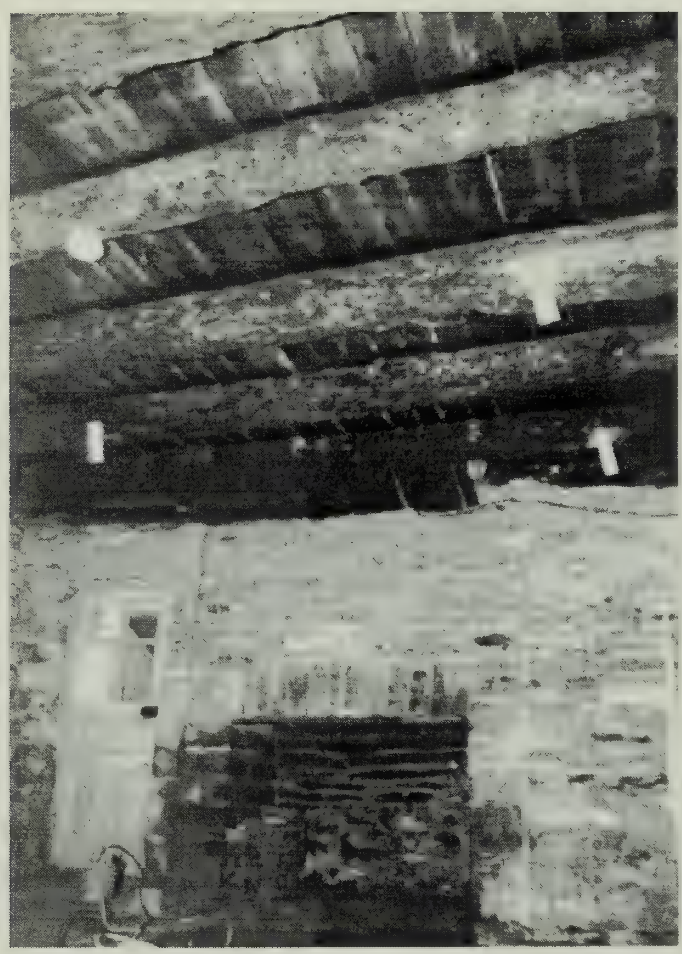

Figure 2.69 - West Wing basement Room 003 ceiling, 1994. The exposed, unbarked log joists are a significant element in the space. (Photograph by the author, ULSG collections).

irregularly spaced and not aligned vertically. The roof rafters have very irregular tool marks which may be due to the difficulty in working with small diameter timber.

Perhaps the most intriguing portion of the house is the West Wing. This portion of the house is constructed of vertical logs in the French Colonial style of *poteaux sur solle* (post on sill). French occupation along the Mississippi River during the seventeenth and eighteenth centuries is responsible for proliferation of this construction system. However, the technique may have influenced builders well in to the nineteenth century, and the building tradition may have survived as late as 1830s in the St. Louis area.[192] The advantage of using this construction technique is that short pieces of timber could be used to shelter relatively large spaces. The *poteaux sur solle* construction method had the advantage of protecting the wooden members from rot by elevating the house on stone foundations. In comparison, the *poteaux en terre* (post in earth), or palisaded, construction method consisted of round poles buried in the earth which were subject to fungal attack. However, only a small percentage of eighteen century St. Louis houses are believed to have

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[192] Melburn D. Thurman, *Building a House in 18th Century Ste. Genevieve, Ste. Genevieve* (Missouri: Pendragon's Press, 1984), 1, and Virginia and Lee McAlester, *A Field Guide to American Houses* (New York: Alfred A. Knopf, Inc., 1984), 121-122.

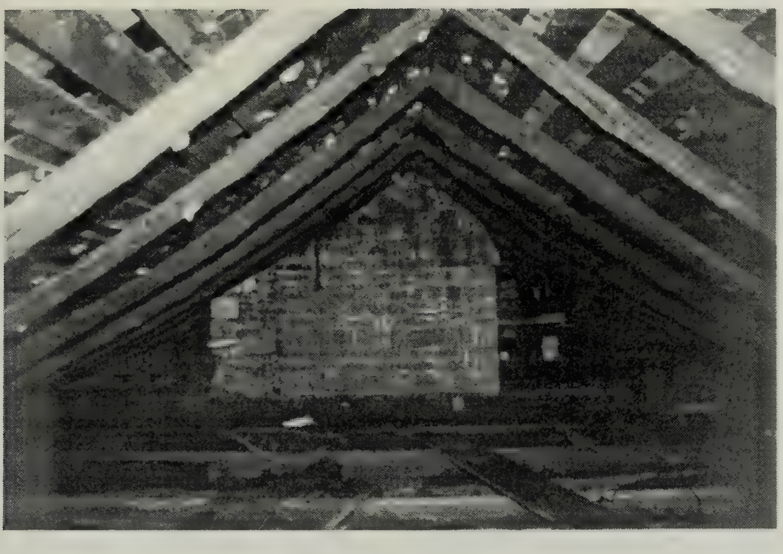

Figure 2.70 - West Wing attic towards the east, 1993. The central chimney stack is shown in the background. Note the deflected pole rafters and the spaced sheathing. (Photograph by the author, ULSG collections).

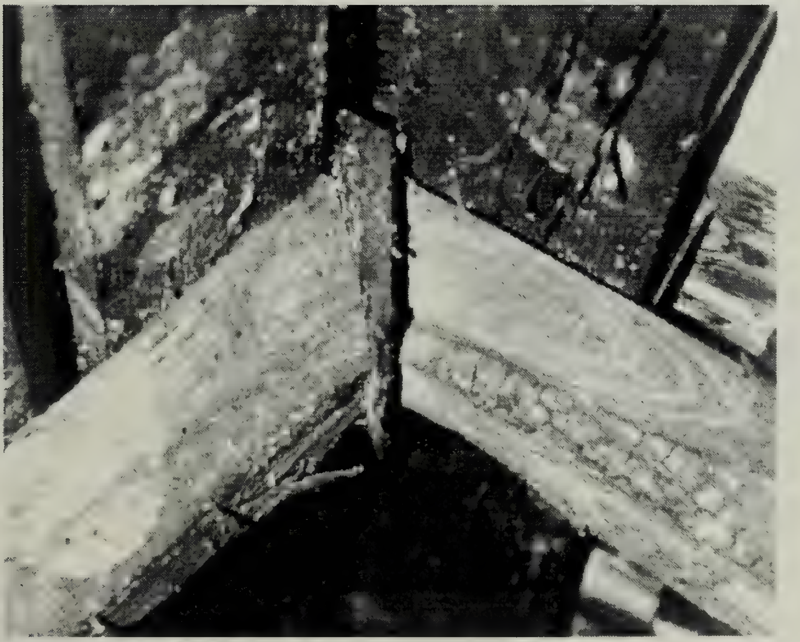

Figure 2.71 - Detail of West Wing pole rafters at the ridge, 1993. The rafter ends were merely butted and shimmed to provide bearing. (Photograph by the author, ULSG collections).

been of the *poteaux sur solle* method, possibly because that method was easier to build.[193] There are few surviving examples of either type of construction in the St. Louis region.[194]

The red oak vertical logs of the West Wing are hewn on the interior and exterior surfaces to a thickness of 6 inches.[195] The logs are set into white oak sills hewn on three sides and a hewn timber at the crown. The vertical logs are tenoned and set into a continuous mortise or trough formed by a pair of narrow hewn sticks nailed to the top surface of the sill. The top end of the logs are mortised and tenoned directly into the top plate. There is no indication that chinking was placed in joints between the logs indicating that the West Wing has always been sheathed in siding.[196]

The unbarked white oak first floor log joists are of impressive size when viewed from the basement (Figure 2.69).[197] These joists span the entire depth of the floor and are tenoned to the foundation sill. The dressed white oak first floor ceiling joists display three types of tool and saw marks; hand hewn, mechanical reciprocating saw, and pit saw.[198]

The red oak attic pole rafters align directly above the joists on a sawn 1 inch board (Figure 2.70).[199] The rafters taper from about 3½ inches at the joists to about 2½ inches at the ridge. They are simply butted at the ridge with no lateral support other than that supplied by the roof sheathing (Figure 2.71).

A dendrochronology study prepared for St. Louis County in 1987 indicates felling dates of 1832 and 1833 for three samples taken from vertical logs, and an 1835 felling date for three samples taken from log first floor joists.[200] No dates were determined for four other samples. Given that tree ring studies are subject to margins of error dependent upon the species sampled and accuracy of base data, this study indicates that the West Wing was probably constructed in the early to mid 1830s. Results of radiocarbon (C_{14}) tests on two West Wing samples indicate possible felling dates one to two decades earlier than given by the dendrochronology study. The radiocarbon test suggests some interesting, although unconfirmable, scenarios for when the vertical log walls were constructed.[201] However, radiocarbon (C_{14}) dating is subject to error due to insect contamination. Physical and documentary evidence indicates that this portion of the house was moved and joined to the Long House prior to 1840 (see Historic Building Chronology, Phase III).

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[193] Charles E. Peterson, *Colonial St. Louis, Building a Creole Capital* (Tucson, Arizona: The Patrice Press, 1993), 44. More carpentry was required to join the foundation sills and post bases.

[194] Jack Luer to the author. There are about 70 surviving examples of French Colonial vertical log structures remaining in North America. The bulk of the examples remain in the Mississippi River Valley particularly clustered in Ste. Genevieve, Missouri.

[195] Alden, samples W-104E-18 AND W-104N-19

[196] Typically, the surfaces of the vertical logs within the walls were channeled to form a key to receive a plaster or mud infill. The West Wing wall timber retain rounded surfaces without channels at the inner wall surfaces.

[197] Alden, sample W-003C-40.

[198] Alden, samples W-204-4 and W-204-7.

[199] Alden, sample W-204-03.

[200] Guyette, *Dating Report*. Dendrochronology is the "science of dealing with the study of the annual growth rings of trees in determining the dates and chronological order of past events." (*The Random House College Dictionary*, Revised Edition (New York: Random House, Inc., 1980), 355.

The framing enclosing Rooms 106 and 107 was constructed sometime between around 1860 and 1875 (See Historic Building Chronology Analysis, Phases IV and V). The roof however, was in place by 1860 as a kind of canopy to shelter a plot of ground at the rear of the house (Figure 2.3). Only original roof framing members, including a hewn beam at the eave, and roof sheathing remain in these rooms. All of the walls and floors of the 1940 HABS Rooms 4 and 5 have been removed. The first floor system was completely removed and raised to the West Wing floor level during 1940 renovation work. During renovation some lumber salvaged during demolition may have been used, although the bulk of the lumber is of 1940 vintage. The roof is constructed of dimensioned, 2 inch by 5½ inch circular sawn, yellow pine framing, fastened with cut nails.[202]

The perimeter wall stud bases are now set into the cast concrete foundation and have no wooden sill. The west wall studs of Room 106 are circular sawn and measure 2 inches by 4 inches, but all studs at the north wall of this room were replaced with nominal 2 inch by 4 inch lumber in 1940. The south wall of Room 107 is framed with circular sawn oak studs measuring 2 inches by 6 inches, but it is unknown at this time if these studs are original or salvaged lumber.

The ceilings of Rooms 106 and 107 are formed by rafters which extend from the West Wing ridge to the north elevation bearing wall. Thus, two completely separate roof systems exist over these two rooms and the northern half of Room 104.

Kitchen (Rooms 108 and 109) and Breezeway 110 areas of the house were added during 1940 renovation work. Although salvaged lumber was used in the construction of the kitchen and a portion of the breezeway roof systems, only a single original structural component remains in place from the historic back porch. A hewn oak beam that spanned the back porch posts and supported the porch roof remains in place within the ceiling of Room 108. All connections on the remaining lumber have been made with wire nails. The remainder of the breezeway is constructed of relatively recent light-frame dimensioned lumber.

Although no longer extant, the Hunt Addition, built between 1818 and 1820, deserves some analysis. From the 1940 HABS photographs taken during demolition work (Figures 2.29 and 2.30), the addition is clearly shown as having been constructed of a braced frame system. The stud, knee brace, and beams appear to have been hand hewn. No salvaged structural members have been found of this portion of the house.

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[201] ESE, 2-8, and Guyette, *Dating Report*. According to radiocarbon test results, the felling date of a vertical log sample (GRT-015) was estimated to be 1785 or 1816, and the felling date for a log floor joist (GRT-003) was determined to be approximately 1823. The 1816 and 1823 felling dates contradict Guyette's analysis of an early 1830s felling date by between 10 to 20 years. The 1785 felling date for the vertical log leaves the possibility open that the walls were constructed much earlier than the floor system. It must be noted that radiocarbon test results are affected by contamination through insect damage and atmospheric content of carbon over time.

[202] Alden, sample W-208-29.

The East Wing, demolished in 1940, is believed to have been constructed of light wood framing. In Figure 2.25 a portion of the East Wing can be seen during demolition work. As seen in the photograph, the roof and wall structures were constructed of sawn dimensioned lumber.

Structural Condition

Lateral Resistance

According to structural calculations, the Main House will resist code specified wind loads but will suffer severe damage in a major earthquake. Lateral weaknesses in the structural frame include the lack of connections between the roof and floor diaphragms, and the lack of anchorage between walls and the unreinforced stone foundations.[203] In addition, the house may be damaged by collapsing chimney stacks.

Roof Systems

The Long House roof is in generally fair condition. Although a snow load capacity of 8 pounds per square foot (psf) has been calculated for this roof, no deflection has been observed during periods of heavy snow fall.[204] Several areas require attention for repairs. The installation of the dormers around 1915 required cutting two of the rafters. Deflection is noticeable in the roof structure surrounding these dormers. The eastern-most rafter of the south roof is deteriorated and will require repair work.

West Wing roof pole rafters are severely deflected due to the undersized diameter of the rafters, insect damage, and creep.[205] The south roof leaf is deflected by 5½ inches at the center of the span. Work was successfully completed in 1993 to stabilize the rafters with a truss system and level the roof with coped sleepers (Figure 2.73).

The West Wing north roof rafters are undersized and poorly detailed at the north bearing wall. Their nearly 20 foot spans have deflected by as much as 3 inches. During 1993 roofing work one failed rafter was found, and at least three rafters near the Long House have deteriorated. The rafters are birdsmouthed at the north wall bearing point, reducing the effective depth of the rafters from 5½ inches to 1½ inches. As a result stress cracks have opened along the grain of the rafters. All of these rafters have at least one supplemental rafter tail to strengthen the bearing point.

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[203] HA, *Structural*, 14.

[204] HA, *Structural*, 7. Local building codes require 17 pounds per square foot snow load capacity. No perceived deflection was noted immediately after two twelve inch snowfalls in 1993.

[205] HA, *Structural*, 8. Creep is the natural permanent deformation of a structural member when subjected to constant loads over a long period of time.

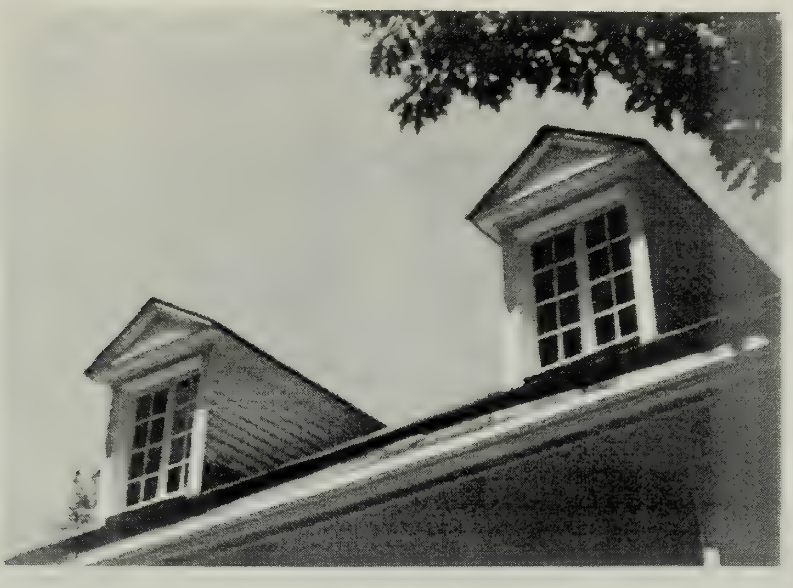

Figure 2.72 - Long House dormers, 1994. These dormers were constructed around 1914. An original rafter at each dormer was severed and moved to make way for the dormers. The displaced rafters have caused some structural distress to the roof framing system. (Photograph by the author, ULSG collections).

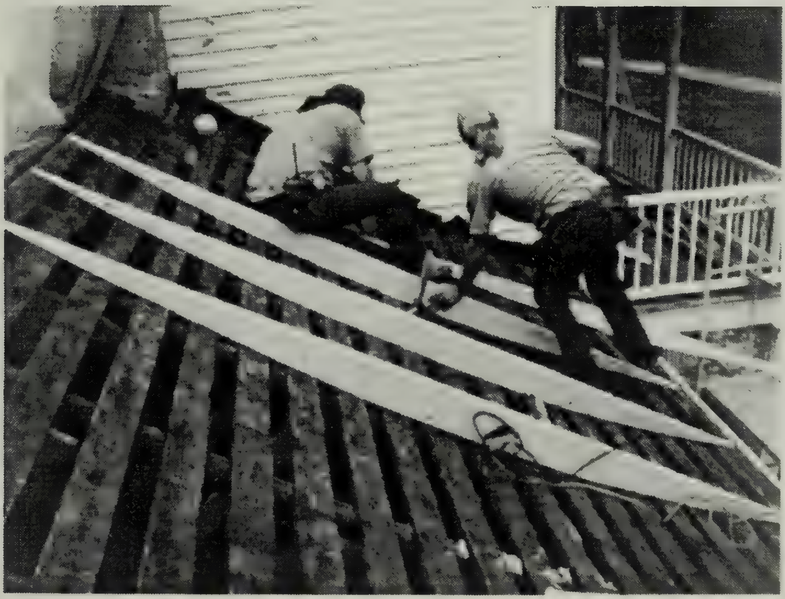

Figure 2.73 - West Wing south roof during stabilization work, 1993. The four roofing layers overstressed the pole rafters and caused the roof to deflect almost six inches. New sleepers coped to the shape of the deflection were installed on the spaced sheathing directly over the historic rafters. Plywood sheathing and temporary asphalt shingles were then installed. (Photograph by the author, ULSG collections).

The Kitchen 108/109 and Breezeway 110 roofs are relatively recent and in generally good condition. However, roof leaks may have weakened some breezeway structural members.

Attic Floor Systems

The Long House Attic 301 floor structural system appears to be in good condition, although second floor ceiling and attic floor finishes conceal the bulk of the system. Deteriorated conditions may be found at the eave during future construction work. One 7 inch square beam adjacent to the west side of the attic stairwell is completely severed to accommodate a forced air duct. But no problems have been observed with that beam since it bears on the east wall of Room 203. There is a noticeable deflection across the floor in the north-south direction just east of the stairwell. The deflection is associated with deterioration in the north perimeter bearing wall at the second floor level.

The joist system which frames the ceiling in Room 104 is solidly constructed with oversized lumber. During 1993 installation of a roof truss system in the attic, ceiling deflection was monitored during the work, since the new truss system bears on the existing joists. No significant deflection was noted and no new cracks were observed in the existing plaster ceiling.

Room 201

Removal of the suspended plaster ceiling in Room 101 uncovered severe deflection in the Room 201 floor system (Figure 2.74). Prior to removal work deflection of the structural members could not be detected because a second leveled finish floor had been laid over the original floor in Room 201, and the ceiling in Room 101 had been lowered. From structural calculations and physical evidence it is believed that the Room 201 floor system failed the day it was constructed. The chimney girt and summer beam are inadequately sized and overspanned to carry even the dead loads of the structural system and floor boards. In addition, there are numerous concerns where this floor system is overloaded, deteriorated, and damaged.

The floor system is overstressed by the presence of heavy ceramic fixtures and tile finish work in Bathrooms 206 and 207. These bathrooms were installed in 1940 to replace a single bathroom installed in 1915. A 1940 leveled floor over the original floor also contributes to the dead loads on the structural system. Prior to its removal in 1992, the Room 101 suspended plaster ceiling contributed a great deal of weight to the system. Some areas of the plaster were over 3 inches thick.

The 2 inch by 7 inch joist system has been weakened at the north wall by severe notching and removal of the portions of the joists to accommodate installation of pipes and ducts. The joists are joined to beams by mortise and tenon joints. Since the bottom half of the joist ends were removed to construct the tenons, shear cracks have developed along the length of the joists due to the reduced effective depth of the members. However, structural calculations indicate that the joists would have a live load capacity of 94 psf if the system were unaffected by damage or deterioration.[206]

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[206] HA, *Structural,* 8.

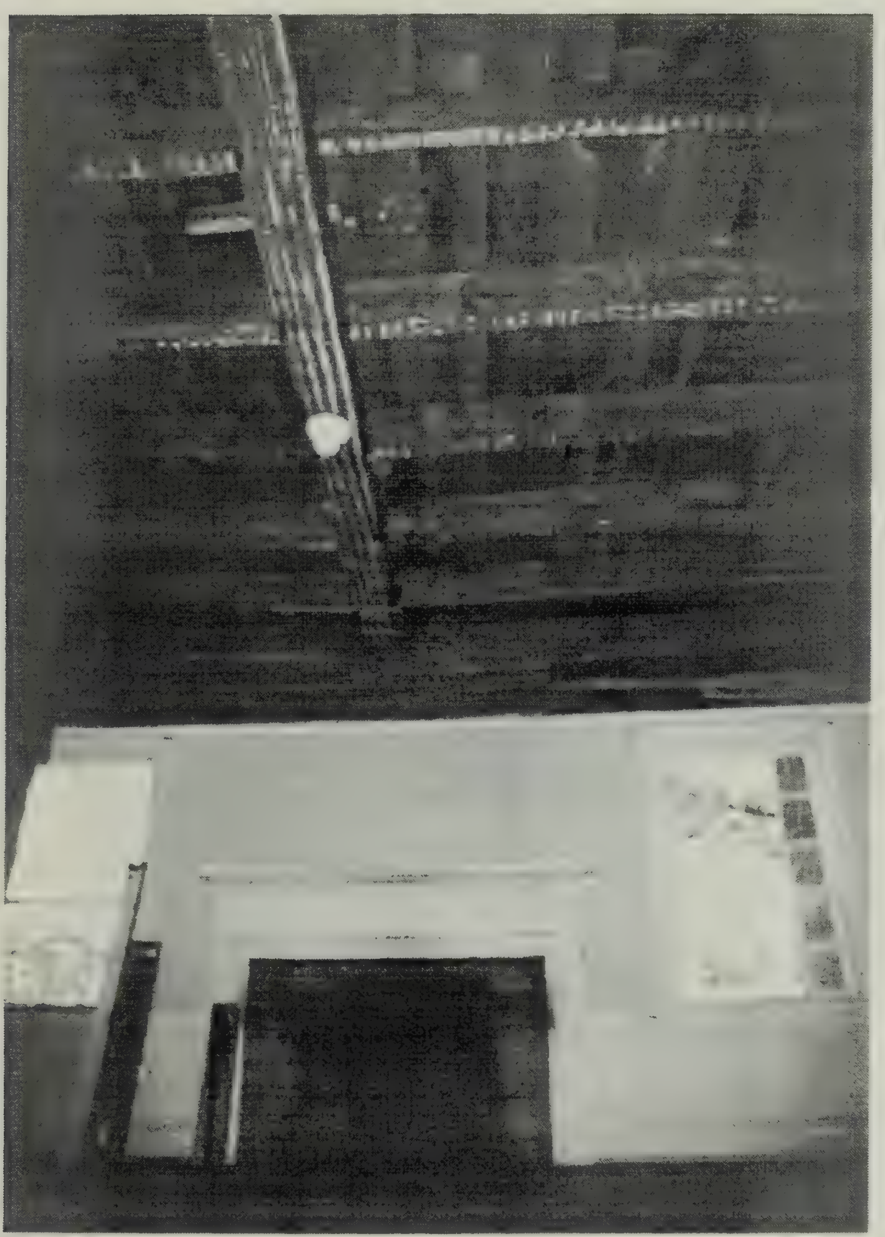

Figure 2.74 - Underside of Room 201 floor framing system viewed from Room 101, 1994. The suspended plaster ceiling was removed in 1992 to investigate several areas of deterioration. The hewn summer beam is seen at the center of the ceiling; pit sawn and hewn joists project from the beam. (Photograph by the author, ULSG collections).

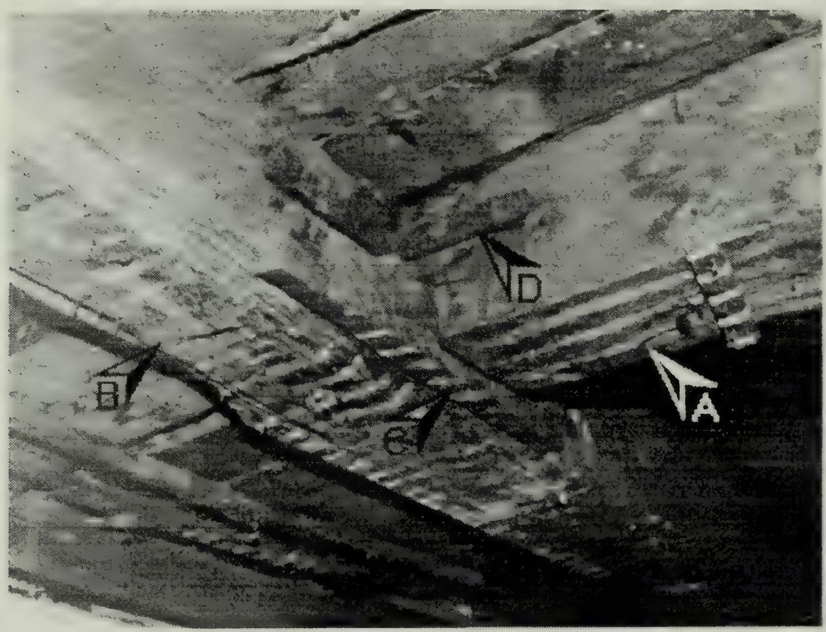

Figure 2.75 - Summer beam to chimney girt joint, ceiling of Room 101, 1994. When the Long House was constructed, the mortise and tenon joint between the summer beam (**A**) and chimney girt (**B**) failed. It is believed that to make repairs, the tenon was severed, a ledger block (**C**) was installed within a notch at the end of the summer beam, and a hand wrought angle iron (**D**) was fastened between the beams. The ledger block and angle iron are fastened with hand wrought spikes. Most of the Room 201 structural floor system forces are concentrated at the ledger block. (Photograph by the author, ULSG collections).

The live load capacity of the Room 201 floor system is principally dependent upon the carrying capacity of the summer beam and chimney girt. When the Long House was constructed in 1818, Room 101 was one large space consisting of existing Rooms 101 and 102. The space was split to form a parlor and stair hall prior to 1840. The summer beam originally spanned from the east wall of Room 202 at the stair, to the chimney girt at the midpoint of the room. Although addition of the Room 101 west wall reduced the span from about 18 feet to 13 feet, the 7 inch square summer beam remains overstressed. Half of the Room 201 loads are supported by the summer beam. The loads are transferred to the midspan of the chimney girt, or the weakest, and most stressed area in the system. Structural calculations indicate that the summer beam and chimney girt presently have live load capacities of only 9 and 4.5 psf respectively.[207] Since the chimney girt is the weakest member of the system, the live load floor capacity for Room 201 is limited to 4.5 psf. The chimney girt has deflected 6 inches This deflection is so severe that the Room 201 original tongue and groove floor boards are no longer in contact with most of the south half of the beam.

Apparently, the mortise and tenon joint between the summer beam and chimney girt failed soon after assembly around 1818 (Figure 2.75). Physical evidence of saw marks shows that the tenon is severed from the chimney girt. The joint is modified to be supported by a hewn ledger board and hand wrought angle iron. To make room for the ledger board, the underside of the summer beam was notched. The ledger board is fastened to the west face of the chimney girt with hand wrought spikes. One angle iron remains at the north side of the joint also fastened with hand wrought spikes. There is evidence that a second angle iron was placed at the south face of the joint, but it is no longer in place.

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[207] HA, *Structural*, 8.

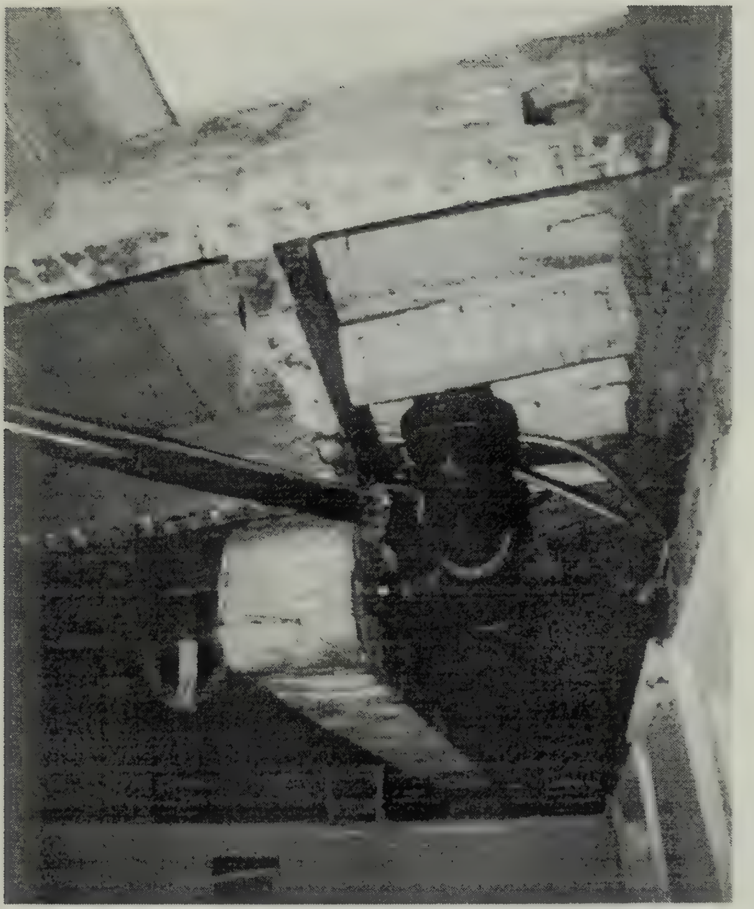

Figure 2.76 - Mechanical systems at Room 101 ceiling, 1994. Installation of plumbing and ducts systems installed for the second floor bathrooms caused damaged to the Room 201 floor structural system. One joist is severed, and several joists and the perimeter beam are severely notched or drilled. In addition, the weight of the cast iron and lead pipes imposes considerable loads on the weakened floor system. (Photograph by the author, ULSG collections).

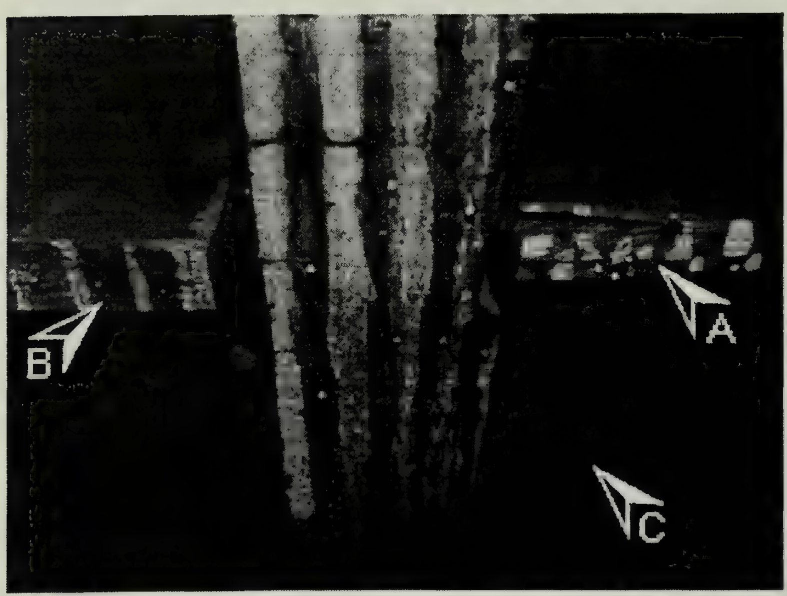

Figure 2.77 - Room 201 summer beam and joists, 1994. The bottom of the summer beam is seen directly in the middle of the photograph from Room 101. While joists north of the beam (**A**) are tight to the beam, the south joist bay ends (**B**) are severely notched or separated from the beam. The oak plug (**C**) is placed in a notch sawn completely through the top surface of the beam. The reason for installation of the plug is unknown, but is suspected to have been an imprudent method of straightening the deflected summer beam. Notching the beam only added to the structural problems of this floor system. (Photograph by the author, ULSG collections).

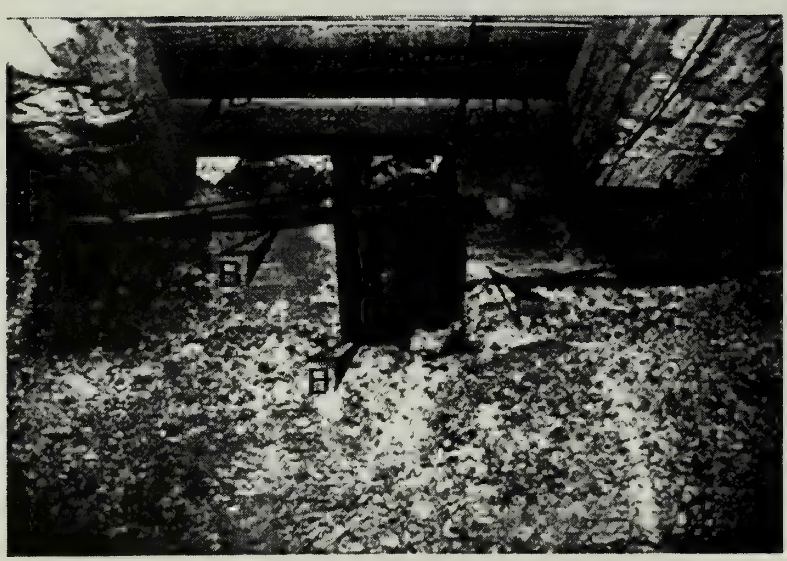

Figure 2.78 - Foundation sill at north wall of basement room 001, 1994. Except for a four foot section of foundation sill (A) in the north wall, all foundation sills have been replaced by cast concrete in the north and east walls. Sewer and water pipes to the second floor bathrooms (B) are installed in a chase cast into the concrete. The concrete extends into the first floor wall cavities to support stud bases. The foundation sill remnant receives two log joists (C), but the remainder of the joist tennons at the north wall are cast into the concrete (D). (Photograph by the author, ULSG collections).

Both beams have curious plugs in the upper surface; two in the summer beam and one in the chimney girt. Notches approximately 1½ inches wide were sawn completely through the top surface of the beams, and squared wooden plugs, or wedges, were forced into the notches. A few theories have been proposed on the rational for these plugs. Perhaps the plugs were installed to straighten the beams prior to installation, or an attempt to reduce deflection after the beams were installed.[208] Whatever the reason, the notches contribute to system weakness.

Other contributing factors in beam weakness include: the joists are deep mortised into each side of the beam, the chimney girt is loaded at midspan by the Room 201 brick fireplace hearth, and the chimney girt is deeply notched approximately 6 feet from the north end to accommodate waste pipes. The two joists directly above the west wall of Room 101 have been severed in several places to accommodate forced air ducts. Since the joists bear on the top of the wall, they behave more as blocking than load bearing joists.

Deterioration in the north wall at the floor of Room 206 may be contributing to deflection of the floor system. Approximately 10 lineal feet of the wall is unsupported as the stud bases are completely rotted away. The breezeway roof structure may be buttressing the second floor north bearing wall of the house in this area.[209]

Room 202

The floor system in this room is very narrow and consequently has a high live load capacity. However, the deflection of the summer beam in Room 201 has affected Stair S-1. The wall between Rooms 101 and 102 may be acting as a fulcrum, or pivot point, for the summer beam. Heavy loads east of the wall have caused the summer beam to deflect in Room 203 and rise in Room 202. The 34 inch wide stair is presently out-of-level by about 1½ inches If the stair carriage is joined to the summer beam, the lever action afforded by the summer beam may indeed be affecting the integrity of Stair S-1.[210]

The south end of the floor may be poorly supported at the wall. The transom window of front door 102-D1 below the south wall appears to have sagged at the middle due to compressive forces. A wooden post may have been removed from roughly the center of the doorway, when that door was added by 1840. The post may have appeared similar to one that now exists at the opposite side of the room against the north wall at the base of Stair S-1. If that is the case then the perimeter beam at the second floor level is spanning the width of Room 102, or about 6½ feet. During investigation work a north-south girt was detected in the ceiling of Room 102. It is believed that the girt joins the perimeter beam above the front door and may also be contributing to loads on the transom window.

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[208] The author has observed a method of straightening studs in other nineteenth century structures. A deep narrow notch was sawn into the cupped surface of the stud, and then a permanent wooden wedge was hammered into the notch to force the stud straight. The compressive strength of a stud is not affected with this method although some lateral strength is lost. However, any weakness is usually taken up by adjacent repetitive structural members or finishes. The builder of this house may have assumed that the stud straightening method could be used on a beam. Since the chimney girt was deflected, or cupped, on the upper surface, the builder may have been assumed that the beam could be straightened with wedges. However, notching a principal, load bearing wooden beam from any surface will weaken the member and cause additional deflection.

[209] HA, *Structural*, 9.

[210] HA, *Structural*, 9. This theory was supplied by the author to the structural engineers. Additional investigations are required to determine the physical relationship between the summer beam and the stair carriage.

Room 203

Floor system design in this room is very similar to that found in Room 201 with the exception that there have been few, if any, detectable twentieth century modifications or deterioration. The 10 foot east-west span over Room 103 below is also 3 feet shorter than found in Room 101. However, the ceiling in Room 103 deflects by about 2 inches where it joins the west wall. A small area of the ceiling was removed to investigate the condition of the summer beam to chimney girt joint. The mortise and tenon joint was found to be constructed very much like that found in the Room 201 floor system prior to early repair work. The joint appears to be in stable condition; no movement or undue cracking has been noted in the Room 103 plaster ceilings. Structural calculations reveal live load capacities somewhat greater than found in Room 201 members; joists - 94 psf, summer beam - 30 psf, and chimney girt - 8 psf.[211] Since the chimney girt is the weakest member, the overall floor load capacity of Room 203 is limited to 8 psf.

Room 101

The floor system in this room was exposed after removal of gypsum board from the ceiling of Basement Room 001 in 1992. The floor structural system is designed very similar to the second floor except log joists were used in lieu of sawn joists. Most of the existing joists have sustained extensive insect damage. The north tenons of the north bay joists are presently encased in cast concrete which was placed in 1915 to replace deteriorated foundation sills at the north and east perimeter walls. The condition of the tenons buried in concrete is unknown. Structural calculations indicate that the joists have a live load capacity of 54 psf although that figure is dependent upon the system being in good condition.[212]

At the time ceiling finishes were removed from Room 001, the tenon joining the summer beam to the chimney girt was found to have been severed. It is believed that the joint is held together with a steel rod or pipe drilled and inserted from the east face of the chimney girt into the end of the summer beam, but this has yet to be confirmed.[213] Upon discovery of the weak joint, a temporary steel column was inserted beneath the joint. The column essentially transformed the chimney girt from a long span beam to a pair of joists.[214] Prior to installation of the column the chimney girt had a live load capacity very similar to that found in the Room 201 floor system, or about 4.5 psf. The chimney girt is further weakened by a poorly executed splice joint at its north end. About 2½ feet

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[211] HA, *Structural*, Appendix A. Calculations were based upon the assumed placement and condition of beams and joists. Since the split lath system at the ceiling of Room 103 is historic, very little of the ceiling finishes were removed. Joist placement was derived by comparison of the repetitive spacing found at the ceiling of Room 101.

[212] HA, *Structural*, Appendix A.

[213] This work was probably accomplished around 1952 when Room 001 was deepened.

[214] HA, *Structural*, 10.

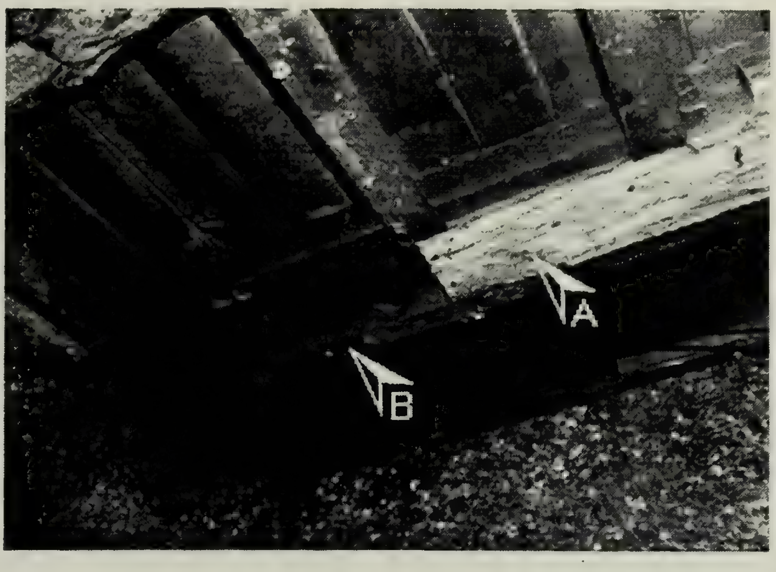

Figure 2.79 - North end of Room 101 floor system chimney girt, 1994. This photograph was taken at the northeast corner of basement room 001. The chimney girt (**A**) was severed during 1914 stabilization work. A 2x6 (**B**) and 2x4 (**C**) spliced to the girt now transfer girt loads to the foundation wall. The north ends of the splices are embedded in the concrete foundation wall. (Photograph by the author, ULSG collections).

has been sawn from the north end of the beam, possibly in response to insect damage (Figure 2.79). At present, only two pieces of dimensioned lumber nailed to the severed beam and embedded in the foundation concrete support that end of the chimney girt.

The summer beam appears to be in good condition. Because two pipe columns divide its overall span into thirds, the beam will support a live load of 74 psf.[215] It is unknown if the pipe columns are bearing on a stable foundation.

Room 102

The floor framing for this room is shared by portions of framing systems of Rooms 101 and 103. This occurred by 1840 when the Room 102 was created by partitioning portions of the other two rooms. The girt which passes beneath the east wall of the stairwell is presently supported by a wall composed of 4 inch square salvaged studs. These studs probably have no footing beneath the basement floor level. The live load capacity for Room 102 is 52 psf based upon the capacity of the existing joists.[216]

Room 103

The floor framing in this room is very similar to that of Room 101. However, the incidence of insect attack and inappropriate repairs is much lower than that found in Room 101. There are indications that at least three log joists have been replaced but the remainder of the structure is original. One joist was removed in 1940 to accommodate construction of basement Stair S-3. The joist was replaced with a 2 inch by 8 inch member. Most of the north quarter of the floor framing system is concealed from view by plaster finishes in bathroom 002-B. The joist system has been determined to bear a live load of 52 psf, or the deciding limit of Room 103.[217]

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[215] HA, *Structural,* 10.

[216] HA, *Structural,* 11.

Two pipe columns support the summer beam, reducing the effective span and thereby increasing the live load capacity of the beam to 74 psf.[218] If the pipe columns are resting on anything more than the concrete floor is unknown, however.

The chimney girt is partially supported by the central chimney stack. Stone masonry was added to the stack directly beneath the hearth of Fireplace FP3 during the nineteenth century. Possibly, the stone was added to provide support at a critical joint between the summer beam and chimney girt, a joint that is vulnerable to failure as seen in other floor systems in the house.

A large crack exists in the west wall plaster finishes adjacent to Fireplace FP3. A crack monitor was installed in 1991 to monitor any movement; none has been detected as of this writing.

Room 104

The large, unbarked, white oak log floor joists span 16 feet and appear to be in good condition. Structural calculations indicate that this floor system will bear a live load of 37 psf in shear.[219] The foundation sills also appear to be in good condition where exposed to view, but deterioration may be found when the exterior skirt board is removed. A photograph from about 1915 taken of the southwest corner of the West Wing indicates that some repair work may have been initiated at that time. The extent of any repair work is unknown at this writing.

The vertical log walls of this room appear to be in good condition, although the logs are concealed by interior plaster finishes and exterior siding. A horizontal crack in the plaster finishes was noted near the ceiling of the east wall, however. No monitors have been installed, but the crack appears to have expanded since 1991. The movement may have been the result of investigation and construction activities in the attic space.

Rooms 106 and 107

The floor and wall systems in these two rooms were constructed in 1940, principally of lumber salvaged as a result of demolition activities at the site. The 2 inch by 8 inch floor joist system was calculated to have a live load capacity of 82 psf.[220] The wall framing systems are in good condition although their bases are embedded in the concrete foundation. Therefore, deterioration of stud bases may be concealed from view.

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[217] HA, *Structural*, 11.

[218] HA, *Structural*, 11.

[219] HA, *Structural*, 11. Shear was the determining factor in live load capacity because the ends of the log joists have been tapered back to join the foundation sills. Had the diameter of the logs not been reduced at the foundation sills, the floor load capacity would have be greater.

[220] HA, *Structural*, 11.

Rooms 108 and 109

The floor system in these two rooms was constructed in 1940, and then modified to expand the space around 1950. All lumber dates to the period of construction, although some boards may have been salvaged from elsewhere. The existing floor system has a carrying capacity of 100 psf.[221] Wall framing systems appear to be in good condition.

Porches

There is physical evidence that the front porch has undergone numerous and extensive repair work during the nineteenth and twentieth centuries. Physical investigations of the second floor deck structural integrity conducted in 1993 revealed that perimeter fascia trim had become a primary structural element. The perimeter 5 inch square hewn beam is severely deteriorated as a result of insect and fungal attack, inappropriate repairs, and design flaws. The east perimeter beam consisting of doubled 2 inch by 8 inch joists hosted a large colony of carpenter ants which severely reduced the structural integrity of the beam (Figure 2.80). The southwest corner of the deck is completely rotted through (Figure 2.82). Because of this, the southwest porch post is displaced west by about 3 inches at its base, and the railing tenons are pulled from their post mortises (Figure 2.83). The south perimeter beam was severed at the southeast corner around 1960 in an attempt to repair the beam. The resulting void beneath the southeast post is infilled with new wood simply butted to the old beam, and the two beams are joined together with an aluminum angle iron at the base of the beams. The angle iron is fastened to the beams with a variety of screws, some of which are not at all embedded into the beams.[222]

A lap splice in the south beam is inappropriately placed directly beneath the fourth post from the west at the second floor porch (Figure 2.81). Normally, this is not a problem since another post is usually placed directly beneath the splice. In this case however, the first floor porch posts were moved to different positions by 1840. Absence of a post to transfer the compressive load from the spliced beam, in effect, created a discontinuous beam. When fascia trim was removed from this section of the porch, the post and beam in the area of the splice suddenly displaced. Structural calculations indicated that the second floor porch has little live load carrying capacity.[223] As a result of numerous structural problems, emergency shoring was immediately installed, and the second floor porch has been closed to visitor traffic.

Second floor porch posts are in good condition. All of the post bases have been replaced with wooden blocks simply butted to the post and fastened with nails. The tongue and groove deck is in very poor condition.

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[221] HA, *Structural*, 11.

[222] Grant L. Mugge to the author, 10 January, 1995. This repair was made by St. Louis County during their ownership of the property according to Mugge. The southwest corner of the porch had nearly collapsed due to rotting wood created by a broken downspout.

[223] HA, *Structural*, 12. If this porch deck structural system had none of the mentioned deterioration, the live load capacity would be 23 psf. In October 1986, a reception was held at White Haven for National Park Service managers and superintendents attending a national conference. In a group photo taken at the front of the Main House, at least 22 individuals stood on the second floor porch.

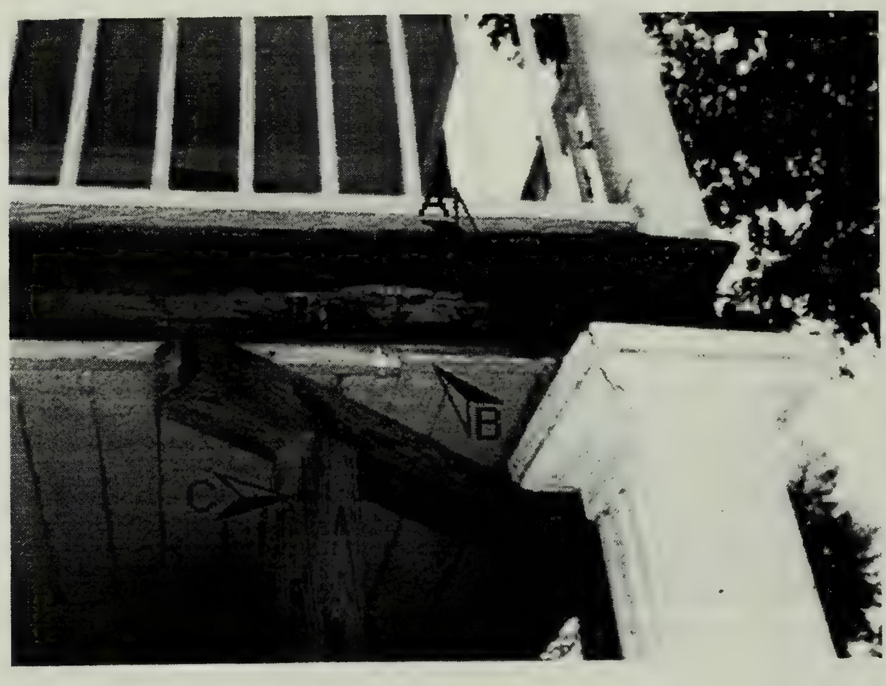

Figure 2.80 - Southwest corner of front porch at second floor level, 1994. An attempt was made by St. Louis County to repair this deteriorated corner. The hewn oak beam is severed at **A**, and a wooden block is inserted between the porch posts. A steel angle iron (**B**) at the lower corner vainly ties the discontinuous beam together. The screws used to fasten the angle iron to the beam pass into rotted wood. Temporary shoring (**C**) was installed when this condition was discovered in 1993. (Photograph by the author, ULSG collections).

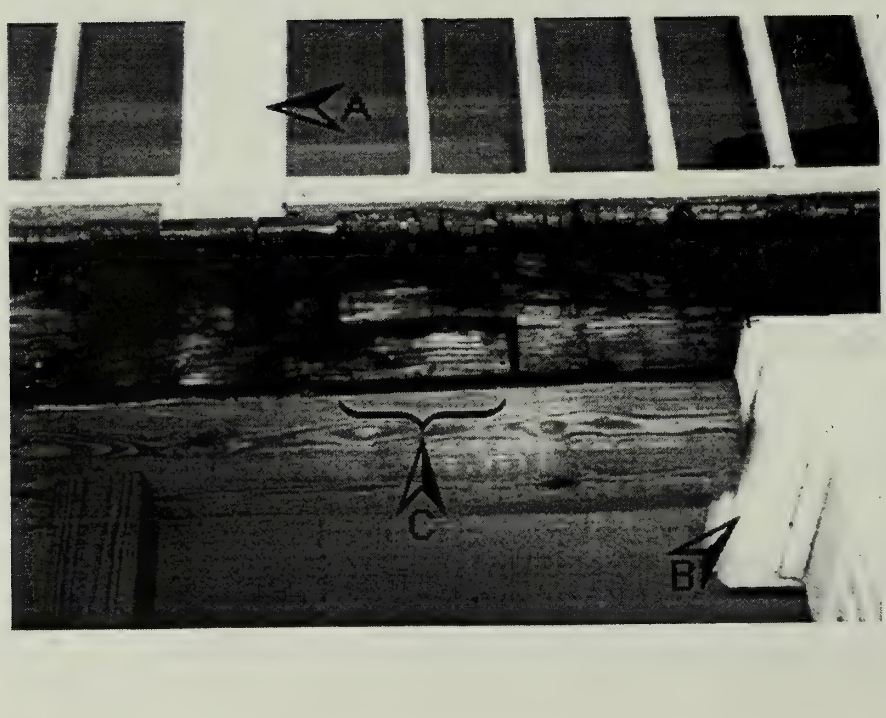

Figure 2.81 - South face of front porch at second floor level at front door bay, 1994. Because of the nineteenth century redesign of the front porch, loads are discontinuous between the second floor post (**A**) and the first floor post (**B**) through the perimeter beam. In this instance, a lap joint occurs in the perimeter beam between the two posts (**C**). The incorrectly oriented lap beam transfers little of the second floor porch post load to the first floor porch post. As a result, the beam at the left acts more as a cantilever than a continuous beam. (Photograph by the author, ULSG

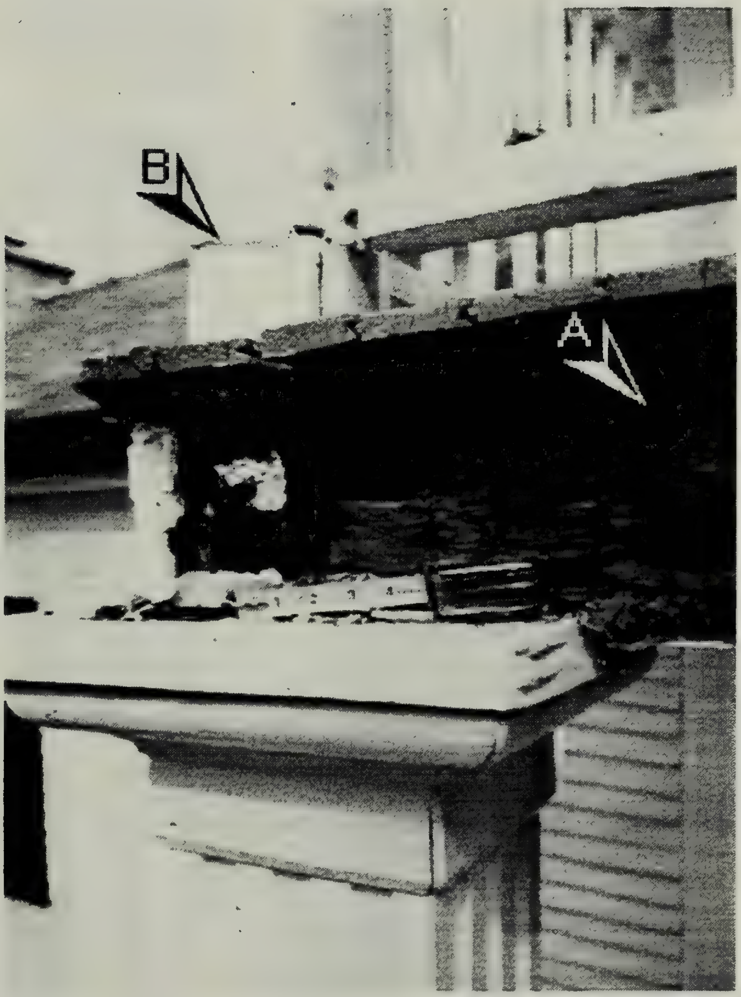

Figure 2.82 - Southwest corner of front porch at second floor level, 1993. This corner is extremely deteriorated. The south perimeter beam end is extremely deteriorated (A), and has no structural integrity. Compressive loads at the second floor porch post (B) have crushed the west perimeter beam. (Photograph by the author, ULSG collections).

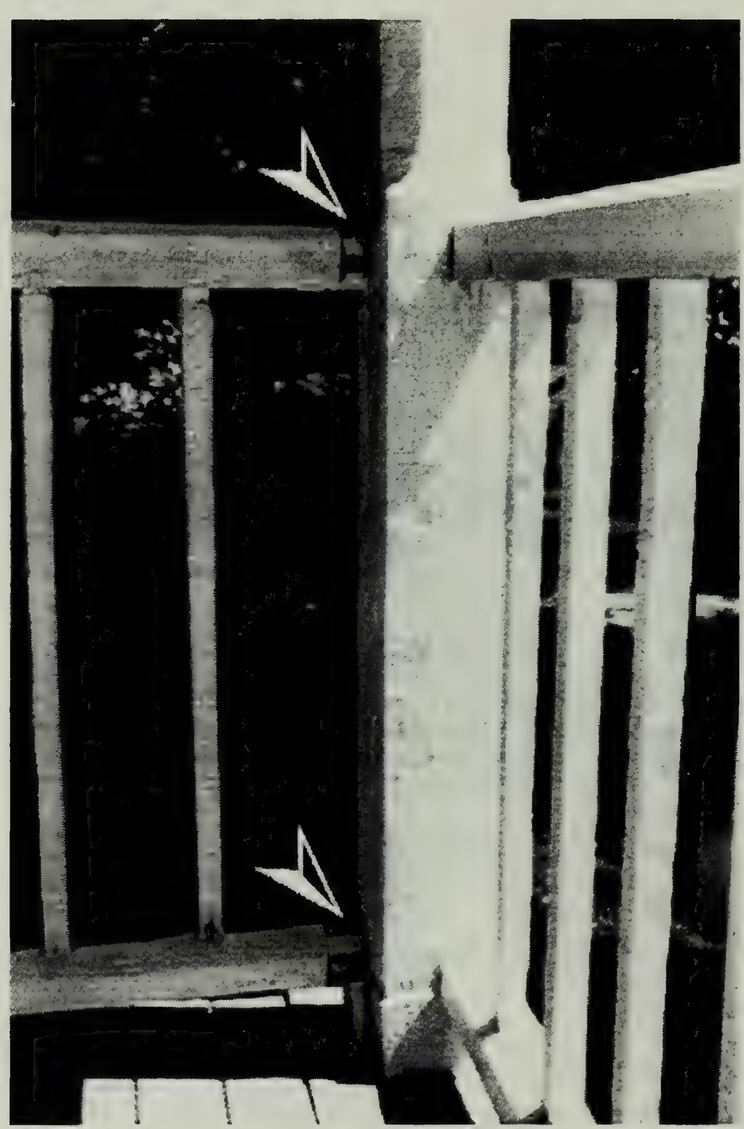

Figure 2.83 - Second floor front porch post at southwest corner, 1994. Deterioration of the second floor structure beneath this post (see Figure 2.82) has allowed the post to drop and rotate away from the porch to the west. Wooden pins fastening the balustrade to the post have failed as a result of post movement. Rail tenons (at arrows) have pulled clear of the post. (Photograph by the author, ULSG collections).

The first floor porch deck is constructed of 2 in. by 8 in. joists. The bulk of the existing carriage is in good condition although there is evidence of spot deterioration around the bases of the porch posts. The posts do not align directly over concrete piers supporting the porch deck. This requires compressive forces to transfer from the posts, through the south perimeter beam, to the piers. Fortunately, the perimeter beam consists of tripled 2 in. by 8 in. boards. Structural calculations indicate that the first floor porch has an existing live load capacity of 51 psf if the system had no deterioration. The east five feet of the porch has a capacity of only 20 psf due to deterioration at the southeast corner.[224] The tongue and groove deck is in very poor condition.

The historic first floor porch box posts were replaced in 1940. The bases and caps of most of the posts are very deteriorated. The capitals are deteriorated as masonite board, rather than sheet metal, was used as flashing.

Breezeway

A portion of the breezeway was constructed in 1940, and then extended around 1950 to join the Main House to the Stone Building. The floor has a bearing capacity of 35 psf which is dependent upon doubled 2 in. by 6 in. beams placed at midspan.[225] There is evidence that the bases of posts between sliding doors and stationary windows are deteriorated.

Exterior Cladding Systems

Siding

Original nineteenth century siding at the Long house is predominantly of hand rived and planed red oak.[226] This beveled clapboard siding measures ½ inch at the butt and varies in width between 5 inches and 6 inches. The exposure of the siding averages 4 inches and is in lengths not exceeding 4 feet 3 inches. The butt ends of the siding are beveled, or shaved, and lapped to form a more weather resistant join than merely butt joining them. This method of cladding is found in early examples of framed residences of the eastern United States, and is certainly an uncommon survivor in a Midwestern structure.[227]

A large portion of the original hand made Long House siding remains intact although most has been removed from the east and west gables, the lower half of the east elevation in response to Wenzlick window additions, and at the first floor north elevation now protected by the breezeway in response to Hunt Addition removal. In addition, spot areas have been replaced in response to deterioration,

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[224] HA, *Structural*, 12.

[225] HA, *Structural*, 12.

[226] Alden, sample W-204W-58.

[227] Abbott Lowell Cummings, *The Framed Houses of Massachusetts Bay, 1625-1725* (Cambridge, Massachusetts: Harvard University Press, 1979), 48, 130. Cummings gives examples where this type of siding was found beneath later additions on seventeenth and eighteenth century structures. In many cases the original exposed hand made siding was replaced with machine sawn siding.

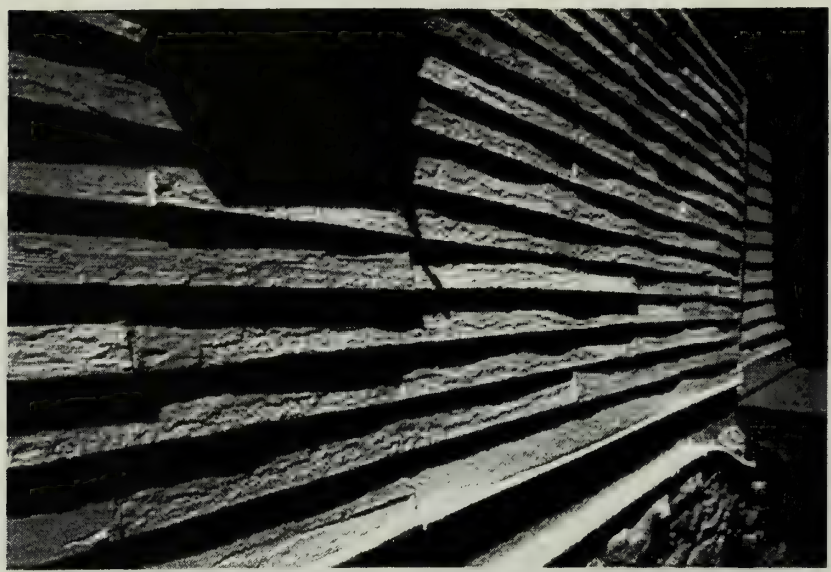

Figure 2.84 - West Wing siding at south elevation, 1994. This hand rived siding is a character defining element at the exterior of the house. Siding on the Long House and West Wing is similar except the siding is butted on the West Wing, while Long House siding is skived. Most of this original siding remains at the south elevation, but much has been replaced on other elevations during the twentieth century. (Photograph by the author, ULSG collections).

or the installation of new windows on the second floor installed by Delbert Wenzlick in 1940. The Wenzlicks installed replacement beveled redwood siding, and in some cases chose to expose the rough vertical sawn surface over the smooth planed surface. All replacement siding runs in long lengths in comparison to the approximate four foot lengths of the original siding.

Original Long House siding was concealed beneath wall finishes when the West Wing was added to the Long House west elevation, and at the north elevation when the Wenzlicks added the kitchen area in 1940. In Kitchen 108/109, plaster lath was furred to the Long House siding and miscellaneous holes were cut to provide access for electrical and mechanical systems.

Figure 2.25 shows that the Wenzlicks removed some siding from the east elevation of the house in 1940, probably in preparation for installation of two windows at Living Room 101. Existing physical and paint chronology evidence indicates that the original siding in the new window areas was totally replaced, but most of the remainder of the siding on this elevation is of high historic integrity.[228] Siding to the south of attic Window 301-W2 was also replaced by the Wenzlicks as evidenced by the building paper underlayment exposed in the attic.

Original siding on the West Wing is similar to that of the Long House (Figure 2.84) although siding ends are beveled on the Long House and merely butted at the West Wing. This gives further evidence that these two portions of the house are of differing construction periods. All of this siding has been fastened with cut nails.

Thick weatherboard siding clads the gable at the west elevation of the West Wing. This siding may have been installed when the West Wing was added to the Long House, as it was installed prior to construction of the west chimney stack. This siding is fastened with cut nails, and was extant at the time Albert Wenzlick purchased the property in 1913 (Figure 2.14). A portion of the north elevation of the chimney stack is concealed at the exterior by a furred wall extending from the Room 106 addition. The gable end siding is concealed beneath this double wall construction and the west chimney stack.

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[228] WUTA, sample P(E)-519.

Figure 2.16 shows early Wenzlick repair activity around 1915 including siding removal from the southwest corner of the West Wing. It is assumed that the siding was removed to access a deteriorated portion of the West Wing, although the extent and nature of the deterioration is unknown. Figure 2.15 shows a large tear-drop shaped area below and to the left of Window 104-W1 which may have been the site of deterioration. The siding currently cladding the area shown in the 1915 photo is replacement material. Paint analysis confirms that the siding has been painted only during the twentieth century.[229]

Cladding at the north and west elevations of Room 106 had been totally replaced by completion of the 1940 renovation work. Windows were replaced and moved, and exterior doors removed during the work, which necessitated installation of new siding. The existing bevel siding is vertical sawn on one side and smooth machine planed on the other. The Wenzlicks chose to expose the rough side to the weather. The siding is now fastened with wire nails but nail holes in the siding and the studs suggest that the siding has been renailed in the past. This siding is furred over the portion of the original rived West Wing siding north of the chimney stack. Paint analysis indicates that the siding is of twentieth century origin.[230]

The lapped joints at the butt ends of the siding were heavily caulked during the 1980s.[231] Otherwise all existing siding appears to be in generally fair to good condition, although spot repairs and caulking are required.

Exterior Trim

Exterior trim has undergone modifications, particularly at the cornices. As seen in the early Wenzlick photographs (Figures 2.14 and 2.15), the rake fasciae at the gable ends were flush against siding. The rake fasciae were apparently trimmed with shallow cove moulding tucked beneath the wood shingles. By the 1920s, this same rake had been built out to its present position 5 inches beyond the face of the siding (Figure 2.20). Apparently, Albert Wenzlick decided to revise the cornice during re-roofing work. Paint analysis confirms that the existing rake fasciae were installed during the twentieth century.[232] A portion of the West Wing rake was removed in 1992 revealing that the original rake board was no longer extant, but paint line evidence indicates that the board was about 4½ inches wide. Physical evidence also suggests that the original boards were fastened with cut nails. Whether any original rake boards and moulding remain on the Long House, concealed within the boxed rake cornice, is unknown.

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[229] WUTA, sample P1(SW)-425.

[230] WUTA, sample P1(NN)-449.

[231] Grant L. Mugge to the author, 10 January, 1995. St. Louis County caulked the siding because there were numerous gaps at the lap joints in the hand rived siding.

[232] WUTA, sample P1(WW)-438.

A short length of moulded rake trim was found between the west chimney and West Wing gable end during 1993 roof work. The 1 inch by 4 inch piece was left in place during Wenzlick redesign of the rake cornices, probably because of the difficulty in removing it. Presence of this painted rake trim also indicates that the chimney post-dated construction of the West Wing. The moulding profile matches those found on West Wing cornice fascia concealed in the attic above Dressing Room 106.

The fascia along the eave cornice has been replaced at the south elevation of the Long House, but only the end boards of the north elevation cornice fascia have been replaced. In general, this fascia is in fair to poor condition due to water infiltration and squirrel damage. The West Wing fascia at the south elevation is original material when compared to the fascia profiles concealed in the Room 106 attic.

Images of a deep crown moulding at south elevation of the Long House eave cornice can been seen in historic photographs (Figures 2.3, 2.11, and 2.15). The crown moulding terminated in an eave return at each of the corners. There are no images in historic photographs of north elevation eave returns, as these areas are all concealed by trees or building elements. Figure 2.13 shows what is believed to be crown moulding on the north elevation eave. All of this crown moulding was removed soon after Albert Wenzlick renovated the house (Figure 2.18). Two pieces of this moulding were discovered stored in the Chicken House loft (Artifacts 46 and 47). The ¾ inch by 4 inch crown moulding consists of a cima recta profile headed by a ¾ inch radius cove mould. Paint lines on the historic fasciae and eave return trim boards at the north elevation indicate that the bottom of the crown moulding was 3½ inches above the bottom of the fascia.[233] By placing the salvaged pieces in line with the paint lines, it was determined that the crown moulding tucked beneath the projected roof sheathing, and angled 30-degrees with respect to a horizontal plane. The eave returns appear to have been capped with a thin-edged board as seen in Figures 2.11 and 2.15.

The siding abuts corner boards at all exterior corners of the house. Most corner boards have been partially or totally replaced by the Wenzlicks. An original Long House corner board concealed within the Kitchen Dining Room 108 attic space at the northwest corner of the Long House was used to compare profiles of other corner boards (Figure 2.86). Paint analysis and photographic documentation was used to verify the location of non-original corner boards. The following corner boards are authentic: the top half of the northeast and southeast corners of the Long House, and the southwest and northwest corners of the Long House. All other corner boards were totally replaced during the twentieth century.

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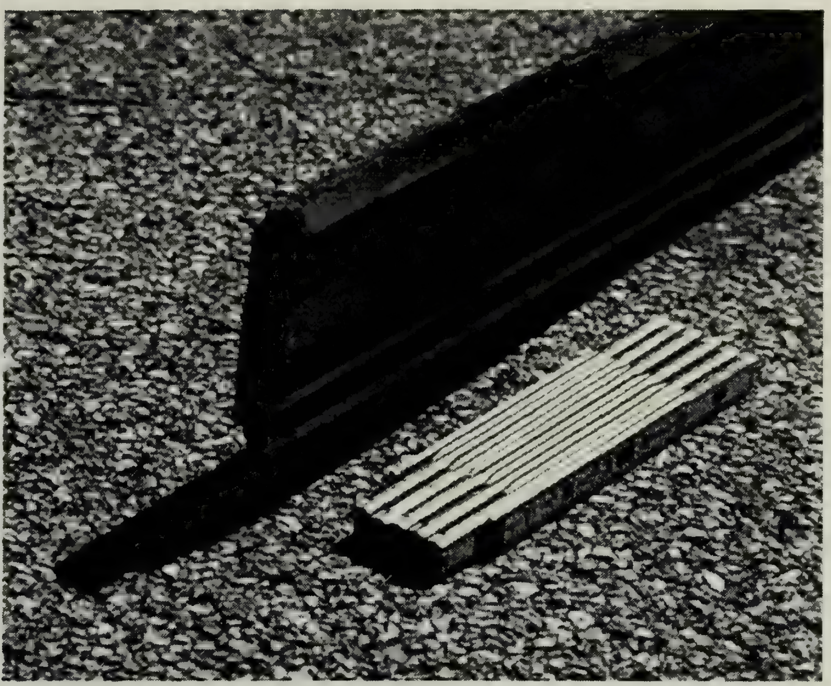
[233] A dark green paint line is very visible at the north elevation fascia. When the crown moulding was removed around 1915, replacement gutters were immediately installed against the fascia, leaving the top half of the fascia unpainted.

Figure 2.85 - Salvaged crown moulding, 1994. Two pieces of four inch deep crown moulding (Artifacts 46 and 47) were found on the site. It is probable, but not absolutely confirmed, that the moulding came from the Long House eave cornices. The moulding was removed around 1914 when the rake cornices were modified. (Photograph by the author, ULSG collections).



In a HABS photograph taken during 1940 demolition of the Hunt Addition, the section of corner board on the northeast corner of the Long House, from the foundation to just above the second floor level, is missing (Figure 2.30). This section was probably replaced by the Wenzlicks during 1940 renovation work. In an early Wenzlick photo (Figure 2.13) there appears to have been a single board fastened to the west elevation at the northwest corner. Presently, there are two boards which form this corner. All existing corner boards appear to be in good condition.

The authenticity of existing skirt boards around the house is in doubt. By the late 1940s the Wenzlicks had removed many of the boards in response to foundation replacement or repairs, particularly the eastern half and front porch of the Long House, and the south and west elevations of the West Wing. A portion of the original skirt board from the Long House was found at the ceilings of basement Closet 003B and basement Hall 002C. The siding and skirt boards at the west exterior elevation of the Long House remained in place when the West Wing was added. From paint evidence it is believed that skirt boards at the south elevation of the Long House are original, although they may have been moved in response to Dent modifications and possibly Wenzlick work.

In early Wenzlick photographs (Figures 2.13 and 2.14) there was no skirt board around the exterior of HABS Room 4. A skirt board was probably added by Albert Wenzlick (Figure 2.22). Siding merely trimmed out the bottom of exterior of HABS Room 4.

The offset between the foundation and the south and west walls of the West Wing may have precipitated the early addition of what can best be described as water deflector boards. In Figure 2.14 these canted boards can be seen at the top of the foundation. Rain water may have infiltrated the foundation at the foundation offset, prompting someone to install the boards. The problem may have necessitated repair work in that area by Albert Wenzlick (Figure 2.16). The installation date

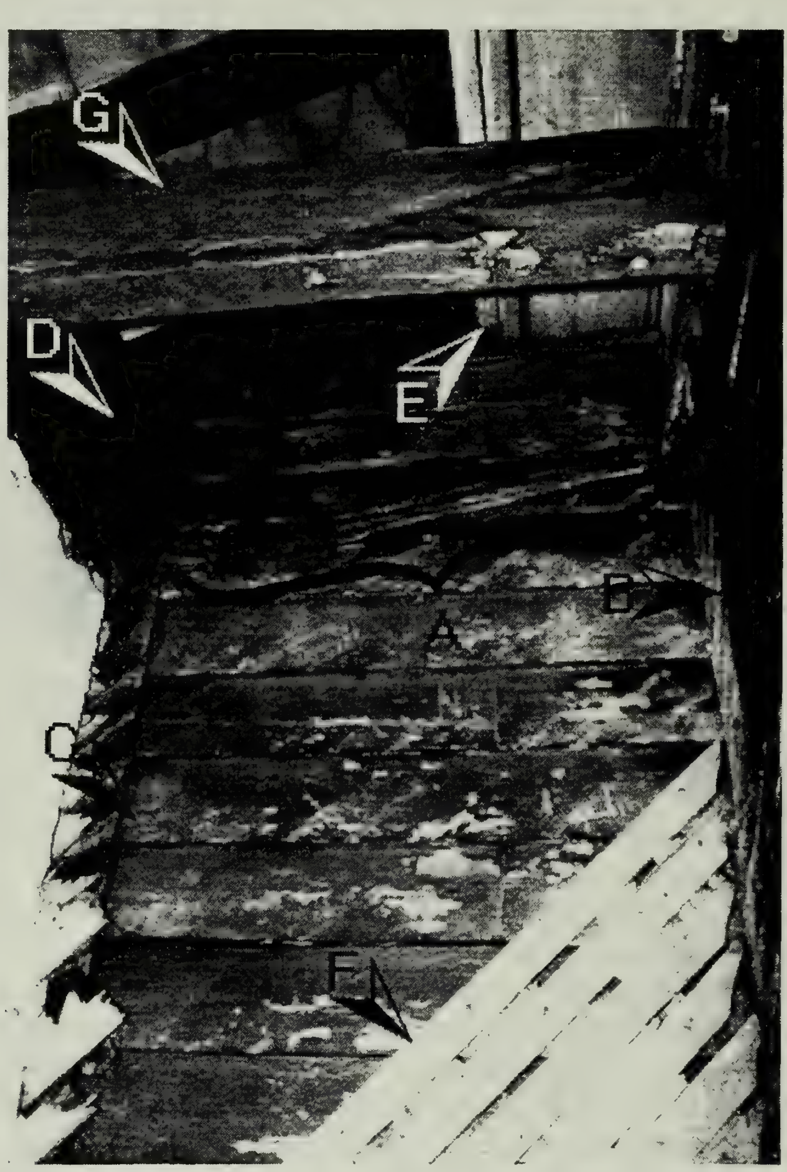


Figure 2.86 - East wall of Pantry 108A, 1994. Removal of pantry wall and ceiling finishes in 1993 revealed several areas of interest. A square length of trim (**A**) identifies the location and slope of the back porch ceiling constructed prior to 1860. The porch ceiling and roof structures were separate and had different slopes. The east casing of Door 108A-D1 and its transom window is at **B** against the south wall of the pantry. This door and window had been encased within the plaster wall since 1940. Original Long House siding (**C**) and corner trim (**D**) were found painted in the two-tone green colors. At **E** is the West Wing cornice now enclosed within the attic (see Figure 2.55). Diagonal lath (**F**) and the ceiling joist (**G**) were installed in 1940 when the kitchen was added to the house. (Photograph by the author, ULSG collections).

of the boards is unknown, but they cannot be seen in the 1860 photograph of the house (Figure 2.3). The boards were removed soon after Albert Wenzlick's occupation.

Remnants of 1 inch square trim from the removed rear porch ceiling were found in the attics of the Kitchen 108, Pantry 108A, and Bathroom 107. A small length of trim at the east wall of the pantry is significant in that it shows the angle of slope of the former porch ceiling (Figure 2.86).

Building Insulation

Fiberglass insulation was added to most portions of the house perimeter walls and attic floors probably during 1940 Wenzlick renovation work. Craft faced, 3½ inch thick, roll insulation was found in the exterior perimeter walls of the Long House and the West Wing attic.[234] The batt insulation contains no asbestos.[235] A thin uneven layer of blown fiberglass insulation was found in the house attic floor cavities. The roll insulation is friction fit, while the blown insulation has a tenacious grasp on the ceiling plaster keys and lath, making for difficult removal. West Wing attic insulation is extremely dirty. No vapor barrier has been detected.

Roof Systems

Sheathing

Roof sheathing type and placement varies at the Long House roof. At the south leaf, the circular sawn sheathing is 1¼ inches thick, varies in width between 5½ inches and 12 inches, and is believed to be pine. The sheathing is principally spaced for wood shingles on this leaf although the spaces have been infilled with wood strips to provide solid backing for contemporary roofing materials. At the north leaf the ⅞ inch thick sheathing varies between 4 inches and 12 inches in width. The species varies throughout, due to numerous repairs and patching in the location of a dormer removed around 1940. But it is believed that the original sheathing is white pine.[236]

Overall, the Long House sheathing is in poor condition. The multitude of roofing fasteners has substantially weakened the structural integrity of the roof. Deterioration due to rotting is limited to sheathing near each of the improperly flashed chimney stacks. The deterioration extends down the north gable rake of each chimney to the eave line. The infiltrating water presumably followed the end rafter. A roof leak at the lower end of the east dormer and two minor leaks at the north roof were repaired during 1993 roof work.

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[234] The insulation was manufactured by Johns-Manville under the name "Ful-Thik".

[235] ATC, 7.

[236] Alden, sample W-301S-32.

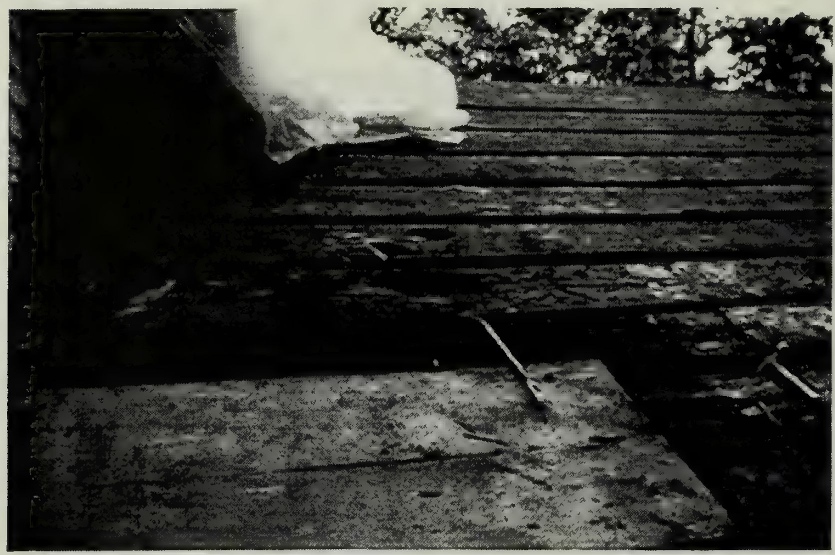

Figure 2.87 - West Wing north roof sheathing, 1993. Severe deterioration was found in the sheathing just below the central chimney. Stone falling from the chimney stack broke asbestos cement shingles which allowed water into the roof system. (Photograph by the author, ULSG collections).

The West Wing roof sheathing is 1 inch thick by 4 inches wide and is vertical, machine rough sawn. The sheathing is white oak,[237] spaced for wood shingles, and appears to be in good condition except at the southeast corner. Sleepers were laid over the south roof to compensate for the 5½ inch rafter deflection during 1993 roof work. One-half inch plywood sheathing was installed over the sleepers.

Roof sheathing, exposed to view at the roof constructed over Rooms 106 and 107, consists of spaced, 1 inch thick, 9 inch to 16 inch random width, circular sawn pine boards. This roof shelters the north leaf of the original West Wing roof. Plane sawn and tongue-and-groove sheathing of various widths replaced this roof's original sheathing several feet up from the eave line probably in response to deterioration. Much of the replacement sheathing was found to have been salvaged from vertical board and batten siding from a barn or other outbuilding. Pieces of old siding and beaded board were also used by the Wenzlicks to shim the roof level. A large area of deteriorated sheathing north of the central chimney was removed and replaced with plywood in 1993 (Figure 2.87).

Shingles and Flashing

All exposed house roofs were covered with asbestos cement tile shingles laid over a mixture of nineteenth and twentieth century solid wood sheathing with an asphalt paper underlayment. The shingles were installed during 1940 renovation work and were identified as containing 40% chrysotile asbestos fibers.[238] These shingles were removed in 1993 in response to their poor condition. A great deal of damage on the West Wing roof area surrounding the central chimney stack occurred due to stone spalling from the surface or falling from the crown and shattering the cement tiles. There had been numerous repair attempts in this area as evidenced by replacement shingles and black roofing tar smeared into fissures.

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[237] Alden, sample W-204-6.

[238] ATC, sample 8113-60.

Figure 2.88 - Discovery of West Wing flashing board, 1993. A coped and beveled flashing board was found in the cavity between the two West Wing roofs. The board protected the junction of the Long House west elevation and the lower, or old, West Wing roof (see Figure 2.56). (Photograph by the author, ULSG collections).

Prior to removal of the asbestos cement shingles, there were three roofs with a total thickness of 2 inches over the West Wing roof. The weight of the roofing materials combined with the slenderness of the West Wing pole rafters caused for the severe deflection in this roof system. Asbestos cement shingles overlaid red granulated roll roofing, and one layer of sawn wood shingles. The redwood shingles were probably installed by Albert Wenzlick as these extend to the edge of the overhanging rake cornice and were fastened with wire nails (See Siding and Trim Analysis).

The north roof leaf of the West Wing can only be seen in the attic above Room 107. Sections of the shingles on this leaf were removed when the roof rafters over Room 107 were fastened to the sheathing which indicates that these shingles were installed prior to the addition of the West Wing to the Long House. There is no physical evidence that any other shingles were previously fastened to the sheathing. The remaining shingles are hand rived and planed and are no longer serviceable.

Prior to 1993 roof work, all valley and stepped flashing was copper, which was installed in 1940. There is no physical nor documentary evidence that sheet metal flashing had been installed prior to 1940. While the copper flashing is in fair to good condition throughout, the chimney flashing has not been installed in a weather tight manner leading to spot deterioration in the surrounding sheathing. All of the chimney flashing has been affixed to the masonry with sealants and no mechanical connection. There is evidence of attempts made by past owners to repair the flashing for leaks with vast amounts of asbestos based roofing tar.[239]

In the absence of sheet metal flashing, the nineteenth century builders evidently relied upon boards to flash vertical surfaces to the roof. During 1993 roof work, beveled boards were found at the juncture between the West Wing roofs and the central and east chimneys. Although the boards were laid tight against the masonry and covered with wood shingles, water must have had free access to spaces below the roof. A board found on the unused north roof of the West Wing was matched with nails at the joint of the West Wing roof with the Long House siding. This unusual board had been carefully coped to fit the siding and was installed at a bevel to flash the joint between the Long House and the West Wing roof (Figure 2.88). The board was probably deemed nonessential when the rear porch roof was constructed over the top of the West Wing roof, and removed by the Wenzlicks during work on the central chimney.

Gutters and Downspouts

A historic photograph of the Main House records that the house had gutters and downspouts by 1890 (Figure 2.11).[240] In that photograph the gutters appear to be 5 inch diameter half-round gutters with 4 inch diameter downspouts hung from above the second floor porch only. When these gutters and downspouts were installed is unknown. Evidently, Albert Wenzlick replaced that system with gutters and downspouts of a similar size and type. From historic photographs it was determined that the gutters were suspended with metal straps fastened beneath the wood shingles. The straps were spaced about 3 feet apart.

Two sections of tin plated downspouts were found in the shed in 1992. One of the salvaged sections appears to match the image of a downspout leading to the cistern in a 1913 Wenzlick photograph (Figure 2.13). Each of the salvaged sections are painted with a single coat of dark green paint which matches a color layer found throughout much of the interior and exterior of the house. The dark green was applied 1874 (see Materials Analysis, Paint).

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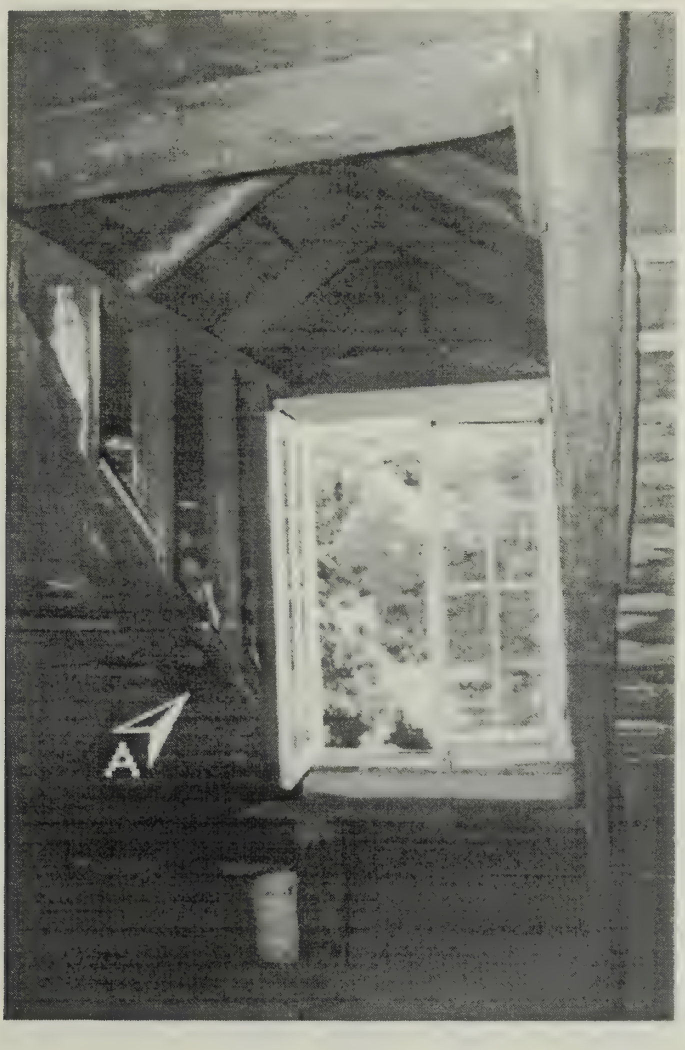
[239] ATC, sample 8113-27.

[240] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," *Historic Houses of Missouri*, Vol. I, 8 December, 1916, 36. This article's author described certain artifacts which had "...fallen from the attic into the wooden gutter box..." This statement is confusing technical architectural terms, as there is no evidence that the house ever had boxed gutters. More likely, the article's author confused the space enclosed by the soffit with boxed gutters.

Figure 2.89 - West dormer at Attic 301, 1994. The rafter at **A** was severed and moved when this dormer was installed. (Photograph by the author, ULSG collections).



From 1940 until 1993, gutters and downspouts on the Main House were fabricated of sheet copper. The gutters were strap hung copper ogee (or K-style) type, and the downspouts 3 inch and 4 inch diameter smooth round. These gutters and downspouts were installed during the 1940 Wenzlick renovation work. Commercial shortages of copper materials during World War II did not deter Delbert Wenzlick from locating a source for the materials.[241] The gutters were in poor condition; having deformed and sagged in places due to ice build-up and ladder damage. The existence of metal screens over the gutters attested to the quantity of leaves which fall at the site in the autumn. The copper gutters and downspouts were removed in 1993.

Many of the downspouts were tied to a subsurface drainage system, but the extent and termination points of the system are unknown. The cistern at the northwest corner of the house was not coupled with the system.

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[241] Bill Wenzlick to the author, 7 April, 1992. Wenzlick stated that his father had a close friendship with the eventual founder of a large building supply outlet in the St. Louis area.

Dormers

The two existing dormers on the Long House south roof were constructed by Albert Wenzlick around 1915.[242] A 1913 photograph shows no image of the dormers (Figure 2.15). Construction of these dormers necessitated structural modification of the two rafters which caused the plane of the roof to deflect (See Structural Condition, Roof Systems and Figure 2.89). The dormer framing and sheathing are constructed of dimensioned lumber salvaged elsewhere on the property. The dormers are in generally fair condition, except for the structural stress on the roof caused by their presence, and poor flashing which has allowed water to infiltrate the attic space.

A dormer at the north leaf of the two story portion of the house was constructed by Albert Wenzlick after 1915 (Figure 2.17), as it does not appear in early Wenzlick photographs. The rationale for constructing the large shed roof dormer is unknown; it did not contain a whole house fan.[243] Removal of the dormer during 1940 renovation work left evidence of replacement sheathing and a single rafter of contemporary dimensioned lumber.

Porch Systems

The prominent two-story front, or south, porch is a major character-defining element on the house. Julia Dent Grant frequently referred to the porch as a piazza throughout her personal memoirs.[244] The earliest illustrations of the house show the second floor porch posts aligned directly over the first floor posts, although "artistic license" may be attributed to these depictions (Figures 2.1, 2.2, 2.4, and 2.5). However, the earliest known photograph of the house shows that, by 1860, the porch posts had been moved to the position they remain in today (Figure 2.3). There is strong evidence that the first floor porch posts were moved by 1843, or perhaps earlier, in response to first floor circulation modifications (See Historic Building Chronology, Phase III).

Overall, the porch is in poor condition. Structural problems exist particularly at the second floor perimeter framing, which is extremely deteriorated due to carpenter ant infestations, rotting timbers, poor detailing, and inappropriate repairs. During physical investigation work in 1993, temporary shoring was installed, and access to the second floor deck limited to prevent collapse, when it was discovered that fascia boards were substantially contributing to the structural stability of the deck. Deterioration is scattered throughout the first-floor undercarriage, decks, and posts (see Structural Condition, Porches).

Piers

Nineteenth century photographs indicate that the first porch foundation was a continuous rubble stone wall (Figure 2.8). Archeological evidence also confirms the existence of stone piers or walls

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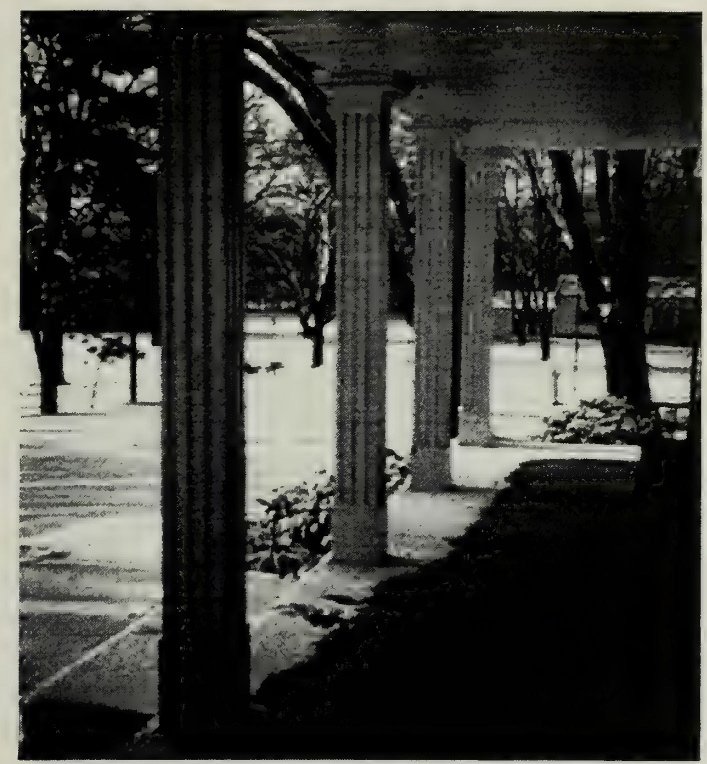
[242] Bill Wenzlick to the author, 7 April, 1992. Bill Wenzlick verified that these dormers were indeed constructed by his grandfather soon after he purchased the property.

[243] Bill Wenzlick to the author, 16 April, 1992. The only fan occupying the dormer was a small oscillating fan.

[244] JDG, *Memoirs*, 33, 49, 51.

Figure 2.90 - First floor front porch, circa 1955. The first floor fluted box posts installed by the Dents around 1838, were replaced in 1940. (Reproduced from stereo-optic slide in Bill Wenzlick collection, copy in ULSG collections).



in this area.[245] By 1890 the stone wall was replaced with wooden piers placed directly beneath the first-floor porch posts (Figures 2.11 and 2.15). These wooden piers were, in turn, replaced with a concrete or parge coated brick wall by Albert Wenzlick around 1916 (Figure 2.17). The existing porch is founded on concrete piers installed by Delbert Wenzlick around 1940. The piers are spaced at about 6 foot intervals rather than placed directly beneath the first floor porch posts contributing to a misalignment of structural forces from the second floor porch posts to the ground. The concrete piers are in good condition although out of context with the historic period (for further information on porch piers see Foundations).

Decks

The first-floor porch deck, including the structural undercarriage, has been replaced at least four times during his lifetime according to Bill Wenzlick. Wenzlick indicated that successive porch decks rapidly deteriorated and his father just kept replacing the material. The last replacement episode probably occurred during April 1968.[246] The existing deck is constructed of ¾ inch by 3¼ inch tongue and groove fir or pine, blind nailed over framing of mixed dimensions but generally measuring 2 inches by 7¾ inches. Both decks were apparently stripped and painted during the late

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[245] Vergil E. Noble, *A Report on the 1991 Archeological Excavations at Ulysses S. Grant National Historic Site, St. Louis, Missouri* (draft) (Lincoln, Nebraska: US Department of the Interior, National Park Service, Midwest Archeological Center, nd), 36-37.

[246] During 1992 physical investigation work of the porch undercarriage, the following inscription was found on the band joist near the front door: "New Floor, 4/9/68, D.S. Wenzlick, Herman Metz, Sam Stuart."

1980s.[247] This painted deck is in fair to poor condition overall; deterioration is concentrated at the edge of the porch and beneath the posts. In an 1883 historic photograph (Figure 2.8) the deck is shown constructed of tongue and groove boards in widths about the same as the existing deck.

The second floor deck is constructed of painted ¾ inch thick tongue and groove boards of widths between 3 inches and 5¼ inches. The variety of widths may be the result of many replacement episodes. Deck patches are prominent at the base of each post. The existing deck is in poor condition, with deterioration confined to the ends exposed to the effects of weather and checking throughout the top surface.

Posts

The square, fluted, box posts at the first floor appear in the earliest lithographs and photographs of the house. They have been and continue to be an important visual element on the house. Bill Wenzlick indicated that his father, Delbert, replaced the first floor posts during the 1940 renovation work on the house.[248] Paint analysis appears to confirm Wenzlick's contention as there are only two or three layers of paint on the posts.[249] However, the original posts may have been stripped of paint during St. Louis County ownership of the property. Contractor Grant Mugge claims that there were numerous layers of paint on the posts when he removed them for stripping during the late 1980s. One color layer Mugge recalled removing from the posts was a bright emerald green similar to the exposed historic siding found in Closet 108-A. Mugge also had the impression that the post boards were very old.[250]

The clearest image of the posts appear in an 1883 photograph (Figure 2.8). The existing posts bear close resemblance to posts in the image, although the 9 inch square cross-section of the existing posts does not match the 8 inch square dimensions indicated in 1934 HABS field notes (see Appendix I, Previous Drawings and Sketches). The existing posts are spaced within plus or minus ¾ inches when compared to the 1934 field notes however.[251] The existing posts are in fair condition. Deterioration is concentrated at the bases and capitals which are poorly detailed and constructed. For example, masonite was used to flash the top of the capitals, and a substantial amount of caulk was used to seal the bases.

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[247] Grant L. Mugge to the author, 10 January, 1995.

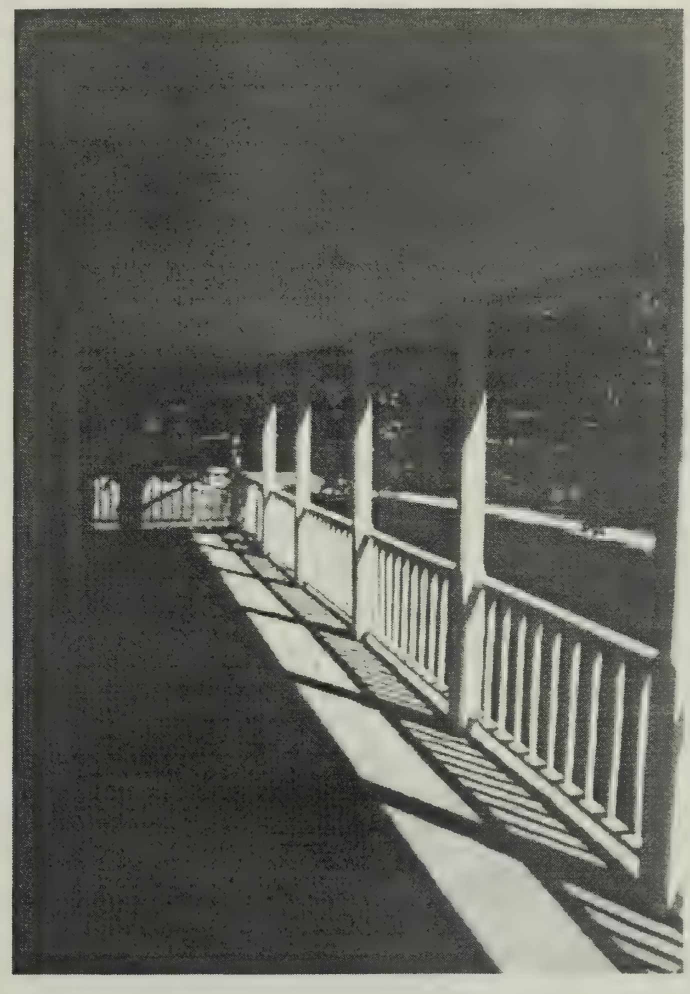
[248] Bill Wenzlick during informal conversations with the author. James Davis stated to the author on 18 March, 1993, that his father, Charles B. Davis, replaced them before 1940, during Albert Wenzlick's period of ownership.

[249] WUTA, sample P1(S)-424.

[250] Grant L. Mugge to the author, 10 January, 1995. Mugge indicated that the posts had to be removed from the building because they were stripped with propane torches.

[251] Eugene V. Kerber et al., "The Dent-Grant Plantation House (White-Haven)," Historic American Building Survey field notes, (21 March, 1934), 25. A notation at on the cover sheet indicating that measurements are incomplete is an understatement. The only dimensions that were recorded were for the plan of the first floor front porch (see Appendix I, 1934 HABS Field Notes).

Figure 2.91 - Second floor porch toward the east, 1994. The solid posts and balustrades are original to the construction of the two story portion of the house. (Photograph by the author, ULSG collections).



The solid, second-floor porch posts are of much simpler design than the former (Figure 2.91). The post corners are chamfered at a 45-degrees and terminated at each end with a coved chamfer stop. There is no reason to believe that these posts are not original to the house. Paint analysis confirms that the center post has early paint layers.[252] Each of the post bases have replacement sections simply toe-nailed to the post with little attempt to flush the surfaces between the new and old material. Examination of photographs taken during the early twentieth century indicate that the second floor porch posts rested on moulded bases at least until 1913 (Figures 2.8, 2.11, and 2.15). The old moulded bases were removed and the post base repairs made by Albert Wenzlick.

Balustrades

Balustrades only occur on the second floor deck; there is no historic documentation or physical evidence to indicate that rails existed at any time at the first floor porch. The existing rails and balusters are of simple detailing (Figure 2.91). The 1 inch square balusters are tenoned into the top rail and bird-mouthed and nailed into the bottom rail. The rail ends are pocketed into the posts, nailed, and fastened in some concealed manner into the corner boards of the house at the return rail. The existing balustrade was probably constructed with the Long House as paint analysis confirms the balustrades to be of early vintage.[253]

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[252] WUTA, sample P2(S)-389.

The balustrades are in generally good condition with moderate checking at the top of each rail. The top rail at the east return balustrade has pieces split from its surface exposing at least one baluster pocket. This appears to be an old wound, as there is a hefty coat of paint over the area. The westernmost balustrade section at the south elevation has been pulled from its post pocket by at least 2 inches. This is principally due to shifting of the post caused by deterioration of deck's structural members (see Structural Condition, Porches). Some of the balusters may have been removed by St. Louis County to facilitate porch repairs during the 1980s.[254]

Ceilings

The first floor ceiling is sheathed in 1 inch by 6 inch tongue and groove boards over most of its surface. Narrower boards at the east end of the ceiling indicate that repair work was required in that area at some time. Bill Wenzlick recalled that he made structural repairs to the second floor beam at the eastern bay. Perhaps the deterioration extended to the ceiling boards as well. While heavily coated with paint, the ceiling material appears to be in good condition and of high historic integrity.

The second floor ceiling is constructed of 5 inch wide boards at their exposed surfaces. It is unknown if the boards are tongue and groove or surfaced four sides. The boards are fastened to the underside of the 7 inch square attic floor joists. This ceiling appears to be in good condition and of high historic integrity.

Lattice and Trim

The existing lattice screen was probably installed, about the same time that concrete piers replaced the stone wall supports, to screen direct view from beneath the porch. The lattice is in fair to poor condition and has no nineteenth century integrity.

The first-floor skirt board has probably been replaced many times but currently is in fair condition. Given the condition of the edges of the deck boards, deterioration can be expected at the concealed surface of this board.

About half of the skirt or fascia boards at the second floor level are of original construction but they have been cut into smaller lengths and probably moved around in response to past repair projects. The ⅞ inch by 8 inch historic boards feature a quirk bead at the lower outside corner. All of the boards are in poor condition.

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[253] WUTA, samples P2(S)-390 and P2(S)-391.

[254] Grant L. Mugge to the author, 10 January, 1995.

Chimneys

The three existing chimney stacks were functionally important in the everyday lives of the building's occupants, they remain significant character defining elements in the appearance of the Main House. Their form, style, use of locally available material, and workmanship technique all exemplify traditional architecture prominent in the St. Louis area during the early nineteenth century. While the stacks have a high degree of historic integrity, their present condition is of concern. On July 25, 1991, the physical condition of the chimney stacks were inspected with the aid of a "cherry picker" to provide access to the stacks and avoid damaging brittle roof tiles. Foundations of the east and west stacks were inspected during summer 1991 archeological investigations, and detailed measured drawings prepared for the east stack in 1995. In summary, the chimneys are in extremely poor to poor condition due to long term weathering and twentieth century modifications and repair work.

East Chimney

This stack serves Fireplaces FP4 in Living Room 101 and FP6 in Bedroom 201. The chimney was constructed in 1818, probably during Theodore Hunt ownership (see Historical Background and Context, and Historic Building Chronology, Phases I and II). The gable end stack is constructed of coursed rubble limestone predominately laid with beds vertical (Figure 2.92). A limestone crown projects about 2 inches beyond each of the chimney faces and is covered with a thick layer of mortar placed over sheet metal caps. A conical sheet metal flue cap projects above the south flue. The cap is impossible to remove for flue inspection unless the mortar wash is also removed.

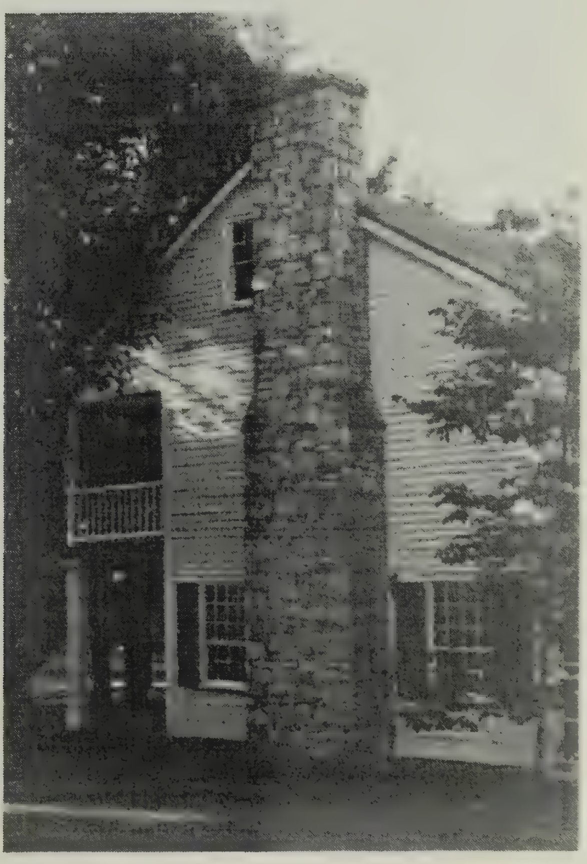

Figure 2.92 - East chimney stack, 1994. Five hand wrought down conductor standards on this stack give evidence that the Main House formerly had a nineteenth century lighting protection system. The stone masonry foundation and crown are very deteriorated. (Photograph by the author, ULSG collections).

During the summer of 1991, archeological excavations at the east face of the chimney stack, the foundations were found to extend 39 inches beneath the existing grade. The random-coursed limestone foundation extends 17 inches below grade, and rests on a 4½ inch stone footing or shelf. The bottom of the footing recedes 3½ inches from the face of the exposed stack above grade. From the footing, the foundation extends the final 22 inches in uncoursed limestone rubble laid up with dirt mortar. This portion of the foundation also recedes by about 3½ inches from the face of the footing. If this condition was constructed in that manner or whether there was structural settlement due to excavation of the adjoining basement during the twentieth century is unknown. The existing chimney stack may have been rebuilt over a portion of the old uncoursed rubble foundations, therefore forming the shelf, but this still does not account for the 3½ inch slope of the foundation in two places.

Overall, the bulk of the exposed stone on this chimney stack is in good condition; only a few stones exhibit delamination or cracks. Portland cement patches and displaced stones near the grade give evidence of deteriorated conditions at the base of the chimney. The many episodes of repointing with portland cement based mortar has accelerated deterioration of the stone. Original bed mortar consists of approximately 4 parts lime to 13 parts sandy dirt.[255] This mortar mix is rich in comparison to samples taken from other areas of the Main House, but, nonetheless, dirt was still found in lieu of sand. Original pointing mortar consisted of a typical mix of sand and lime as found in other areas of the house.

A heavy iron bar ties the masonry stack to the house's wood framing at the attic level. One end of the bar is embedded into the center withe of the stack, and the other end is bent and believed to be mortised into the top of the eastern-most attic floor joist beam. It is believed that the bar was placed after construction of the attic floor. A section of the attic floor is cut away directly above the tie bar. It is believed that the floor was laid prior to construction of the chimney, and that a small portion of the floor had to be removed to install the bar. The reason fro installation of the tie bar is unknown. Typically chimney stacks are structurally isolated from the house to prevent deformation in the framework due to settlement of the stack.

The west face of the chimney near the crown is in poor condition, with evidence of several episodes of portland cement repointing. The strong portland cement mortar has contributed to deterioration of stone surfaces. The east face near the crown is in very poor condition for the same reason. Three stones at the southwest corner near the crown have displaced and appear to be unstable. A couple of small holes in the mortar joints at the north face near the crown that also need attention. The existing cap and crown are in fair to good condition. One stone is missing at the northeast corner at the grade line. The area of this chimney stack which is exposed in the attic space shows signs of long-term water infiltration through poorly installed stepped flashing. The mortar is in fairly good condition requiring only spot pointing.

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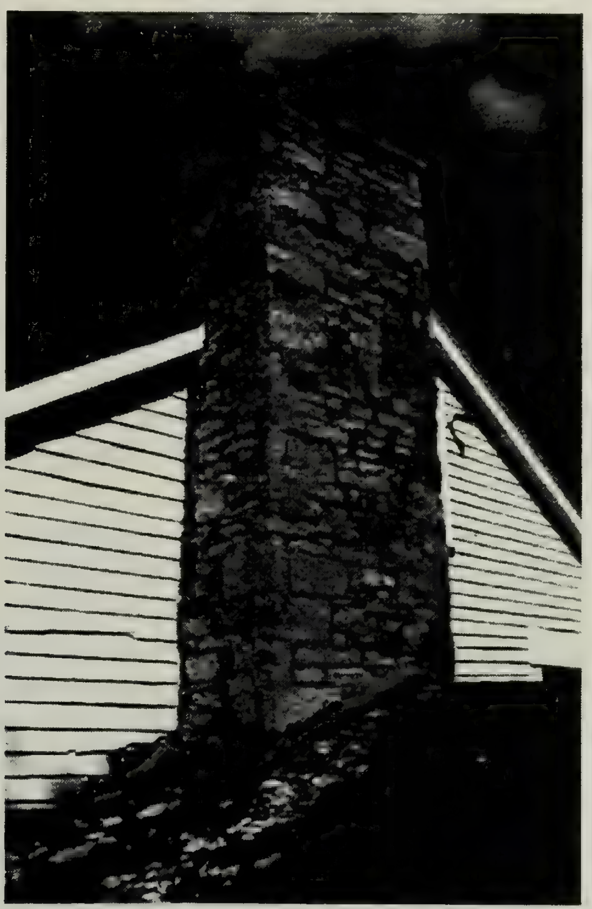
[255] Arbogast, *Mortar Analysis*, 6. Sample M-E-39.

Figure 2.93 - Central chimney stack, 1993. Stone from the deteriorating crown broke many of the asbestos cement roofing tiles. (Photograph by the author, ULSG collections).



Four hand wrought iron lightning protection brackets are visible at the east face. It is unclear if this hardware is original to the chimney construction, but the brackets should be preserved as a testament to the early system (See Lightning Protection).

Common wire and chicken wire nails are scattered over the surface of the chimney. These fasteners were placed during the late nineteenth or twentieth centuries to provide support for wires or string which, in turn, supported lush vine growth (Figures 2.11 and 2.20).

Central Chimney

This stack serviced the basement furnace, Dining Room 103 Fireplace FP3, and Fireplace FP5 at Bedroom 203 (Figure 2.93). It was constructed in 1818 and modified in 1915 to accommodate a basement furnace flue. The central chimney initially served as a gable end stack for the west end of the Long House prior to the addition of the West Wing. When the West Wing was added to the Long House around 1840, it concealed a large portion of the stack behind the first floor walls and beneath the West Wing attic.

Recent access to this attic space revealed virtually undisturbed mortar and raised joints on the previously exposed surfaces (Figures 2.63 and 2.70). The stone is laid in a very soft dirt and lime based mortar.[256] The pointing mortar is similar to other sand and lime mortars found throughout Main House masonry. The finish joints protrude from the stone surface and are bevel struck at the top and bottom, giving a raised pointed mortar line. No doubt the soft bed mortar erodes easily after the protective pointing mortar deteriorates. This condition accounts in part for some of the deterioration on this particular chimney.

This stack is unusual in that the exposed rubble foundation in the basement is extremely bulky in comparison to the efficient use of masonry in the east chimney stack (Figure 2.94). This foundation extends beneath the entire first floor hearth of Fireplace FP3, whereas all other hearths in the house span the distance from the chimney stack masonry to the chimney girt or log joist. There is evidence of a rough vertical masonry joint between the primary stone base and the shoring beneath the first floor hearth indicating that stone shoring was added at a later date.

The reason for this condition is unclear, although it is postulated that the chimney's foundation was modified when the West Wing was added. Perhaps the soil beneath the base of the original chimney stack foundation had to be shored to accommodate the adjacent West Wing's deep foundation. The quality of stone work in the shoring matches more closely to that of the West Wing foundation masonry than that of the chimney stack masonry. Ledges formed by step-backs on this chimney stack foundation formed convenient supports for blocking the heavy timber joists and sills. It is unknown why the heavy masonry was added beneath the hearth although this may have occurred

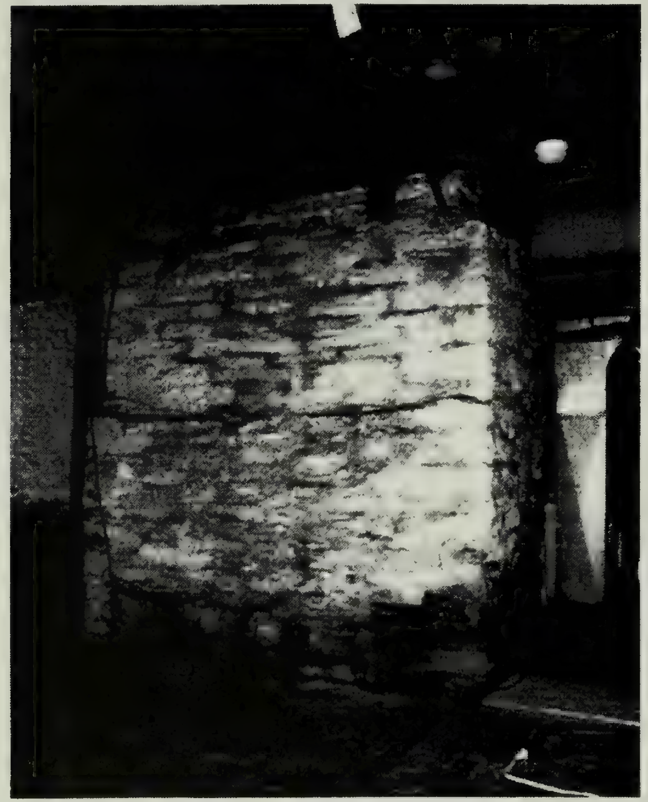


Figure 2.94 - Central chimney stack base in basement Room 003, 1994. This face of the chimney stack was exposed at the exterior prior to addition of the West Wing.

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[256] Arbogast, *Mortar Analysis*, 4. The analysis indicated Sample M-204-11 contained 2 parts lime to 15 parts dirt.

when Room 002 was deepened by Delbert Wenzlick around 1940.[257]

The stone shoring beneath the first floor hearth may conceal a basement fireplace opening. Since there is no existing physical evidence that the Long House ever had a cooking fireplace on the ground floor, cooking may have taken place in Room 002 prior to the addition of the West Wing basement kitchen. Room 002 may have been a full basement prior to construction of the West Wing, when Room 002 may have been filled in (see Room Finish Analysis, Mechanical Room 002). If Room 002 had been a full basement during the early nineteenth century, cooking functions may have occurred here until construction of the West Wing basement kitchen. The problem with this theory is that the existing chimney stack can only accommodate two flues and not the requisite three to service a fireplace on each of three floors. Perhaps archeological excavations in the floor of Room 002, or detection of metal indicating the presence of lintels or pot crane gudgeons beneath the eastern face of the shoring would provide clues.

Mortars analyzed at the basement portion of the central chimney stack vary widely in mix constituents and proportions. While the mortar of stone exposed near the ceiling in Room 003 is consistent with that found on the same stack in Attic 204, the lower, shored portions of the base are different. Shoring stone is laid up in a dirty sand/lime mortar, while the upper chimney is bedded in dirt mortar.[258] This indicates that the shoring may have been added after construction of the Long House stack.

The exposed section of the central chimney stack is constructed of coursed rubble limestone, and, until 1993, had a simple limestone slab crown projecting about 2 inches past each of the faces. Corners are laid up with squared quoins, natural bed oriented vertically. The masonry is laid up in 8 inch to 10 inch lifts. The crown sported a single sheet metal flue projecting through a mortar and sheet metal cap possibly installed by the Wenzlicks. The metal flue was located above the south masonry flue. The sheet metal cap rested on a bed of portland-based mortar applied to the top surface of the crown; a wash of mortar covered the sheet metal. This cap and crown, including the underlaying stone, were severely deteriorated.

In 1993 the top five feet of the central chimney were removed when a portion of stone near the crown collapsed. About half of the stones within three feet of the crown crumbled to gravel upon removal. Salvageable stones were marked, overall dimensions recorded, and placement documented on photographs. The flues measure about 16 inches square and are unlined. The north and south chimney faces are constructed of an exterior veneer, backed by an internal face of small rubble stone. This double-flue wall construction is not tied together, and voids between the two walls are liberally filled with dirt-based mortar. The stone wythe separating the flues was completely missing for a distance of 64 inches below the top surface of the crown. The missing stone was discovered in the smoke chamber of the second floor fireplace.

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[257] Bill Wenzlick to the author, 7 April, 1992.

[258] Arbogast, *Mortar Analysis*, 4 and 6. Samples M-204-11 and M-003E-17 are dirt-based mortars while sample M-003E-15 is dirty sand/lime-based mortar.

Prior to removal work, a large hole existed completely through the chimney into the north flue at the northwest corner 2 feet beneath the crown. A smaller hole existed at the west face about 5 feet below the crown. It appears that this stone broke away from the stack, hitting and breaking the brittle asbestos/cement roof tiles. The exposed faces of the chimney have been poorly repointed with various mortar mixes during the twentieth century; all of the mortar is of portland based cement. The mortar joints are cracked and broken and the stone surface delaminating.

The severe deterioration of this chimney is predominantly due natural weathering processes, and the venting of oil and natural gas fueled furnaces up the north flue. The acidic nature of the furnace gases decayed the limestone and original mortar to the point that the chimney is structurally unsound. Inappropriate repointing techniques and materials have also accelerated the chimney's deterioration.

The deteriorative effects of the flue gases on this chimney stack brought to question the path of furnace fumes through the existing chimney. It is assumed that the house functioned without a furnace throughout the nineteenth and into the twentieth century. Therefore, no flue was required at the basement level of the central stack until installation of a boiler by Albert Wenzlick around 1915.[259] Further investigations revealed that a portion of the existing masonry stack was modified to include a furnace flue opening at the basement and an 8½ inch by 13 inch clay flue liner for Fireplace FP3. It is believed that the old north stone-lined flue accommodates two clay flue liners. These modifications are confined to the north quarter of the stack, and extend from the basement to the West Wing Attic (204). The modified stone work is crudely laid with portland cement and in no way matches the original coursed rubble work.

The reason for the collapse of the stone lining, or wythe, dividing the two flues near the crown may have been due to destructive furnace fumes eroding the stone in order to vent at the improperly place metal flue opening. Because masonry modifications terminate in the West Wing attic, it is assumed that the two clay flue liners terminate at that location into the single north masonry flue there as. This condition created two dangerous situations. First, the furnace gases had an opportunity to backdraft into the house's interior through the first floor fireplace, creating a strong potential for carbon monoxide poisoning within the house. Second, eroded mortar joints in the stone flue could have expose adjacent wood construction to high heat levels generated by simultaneous use of the fireplace and furnace. Since 1940 the risk of structural fire and/or suffocation of house residents has been very high. As a result of this determination, the furnace flue was removed from service in

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[259] Unless it is later proven that a fireplace existed in the central chimney stack in basement Room 002. See previous discussion concerning this issue.

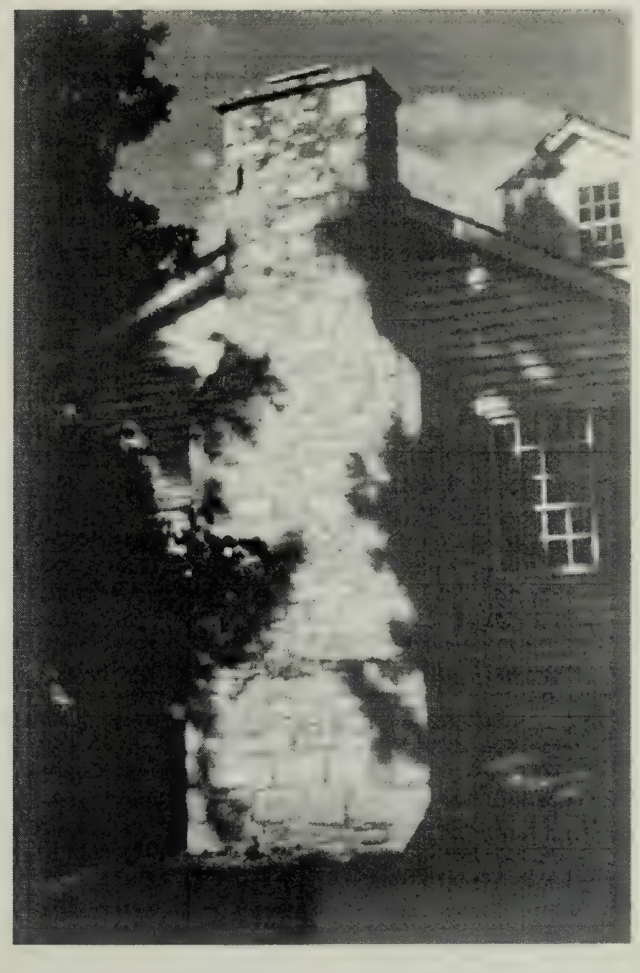

Figure 2.95 - West chimney stack, 1994. Of the three stacks, this one is the most stable. (Photograph by the author, ULSG collections).

1992. The NPS removed the top 5 feet of the crown in September 1993 in response to a partial collapse in August of the same year.[260]

West Chimney

This gable end chimney stack was constructed at the time the West Wing was added to the Long House during the late 1830s, and serves the basement (FP1) and first floor fireplaces (FP2) of that portion of the house. The chimney is constructed of limestone, bed laid vertically in most cases, with a limestone crown projecting about 2 inches beyond the chimney faces (Figure 2.95). The crown is covered similar to the central chimney except that the sheet metal flue is centrally located and impossible to remove without demolition of the cap. Therefore, the condition of the flues is unknown. The cap and crown are in fair condition.

This chimney is unusual in that the masonry is constructed proud of the siding whereas the siding butts to the surfaces of the east and central stacks. In other words, the east and central stack masonry can be seen in Attic 301 but the masonry in West Wing attic 204 is concealed behind the siding.

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[260] A small tremor during August may have been the reason for the collapse.

This is yet another indication that the West Wing was moved and joined to the Long House as one piece rather than having been built from new materials, or erected from a disassembled structure (see Historic Building Chronology, Phase III).

Bed mortar for the west chimney stack is composed of lime and dirty sand.[261] This mortar characteristically differs from the dirt based mortar found throughout the Long House. The dirty sand was probably obtained from a natural deposit such as a nearby creek bed. This chimney is poorly repointed as evidenced by several colors and textures of portland based mortar. The top four feet of the stack are in poor condition. The northwest corner near the crown exhibits open mortar joints. The chimney shoulders are in good condition however.

Archeological excavations at the base of the stack did not extend to the bottom of the foundation, but the foundation is assumed to extend to the depth of the surrounding West Wing foundation. This stack foundation differs in construction from the two other chimney foundations in that large dry laid limestone blocks are used instead of rubble. The foundation appears to be solid and stable.

In photographs taken in 1913 (Figures 2.14 and 2.15), two square dark patches appear about 5 feet apart and about 12 feet above the ground at the west elevation. The location of these spots has been verified although the voids have been filled with mortar and stone. It is speculated that the spots may actually have been the remains of wooden scaffold supports that were erected to facilitate construction of the upper reaches of the chimney. Once the chimney had been completed the outrigger supports were sawed off flush with the stone face. The supports may have deteriorated, which would account for the infill work.

Common wire and chicken wire nails are scattered over the surface of the chimney. These fasteners were placed during the twentieth century to provide support for wires or string which in turn promoted vine growth (Figure 2.27).

Fireplaces and Chimney Pieces

The quantity of Main House fireplaces is indicative of the life style of occupants until the early twentieth century, when a centralized heating system was installed by the Wenzlicks around 1915. Each of the five primary living spaces in the structure has a fireplace. A sixth fireplace in the West Wing basement served to prepare meals while the remainder functioned to provide heat and light. Prior to the addition of the West Wing and Stone Building cooking fireplaces, cooking activities in the Long House may have taken place in basement Room 002 (see Chimneys, Central Chimney). No other fireplace within the Main House is large enough to handle cooking chores.[262]

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[261] Arbogast, *Mortar Analysis*, 6. Sample M-W-40.

[262] Paul R. Ladd, *Early American Fireplaces* (New York: Hastings House, 1977), 22 (hereafter cited as Ladd, *Fireplaces)*. During the Colonial period "the kitchen maintained its accustomed place on the first floor and was the largest fireplace of all."

The overall historic integrity and condition of the fireplaces are good. Modifications have been made to some of the fireplaces and mantles that have compromised some integrity, particularly at hearths and the bases of wooden chimney pieces. These modifications were principally made during the Wenzlick period of occupation. Evidence of chimney decay is evident in at least three flues and discussed elsewhere in this document (see Chimneys). One twentieth century account indicates that five fireplaces were bricked when Albert Wenzlick purchased the property. Albert apparently removed the brick during his early work on the house.[263]

The 1940 HABS drawings are in conflict with existing physical evidence for the fireplace masonry lintels (See 1940 HABS Drawings, Sheet 2). The HABS drawings indicate that all fireplace lintels were constructed of a single stone whereas only the Dining Room 103 Fireplace FP3 exhibits this type of lintel. The remainder of the fireplaces have a composition jack arch and iron bar lintel consistent with early nineteenth century building techniques, and appear to be of original construction. There is no evidence that these fireplace lintels have been modified in any way since 1940. Even the mortar is consistent with early mortars found on the central chimney stack. The reason for the discrepancy between the 1940 HABS documentation and the existing physical evidence is unclear. Perhaps the 1940 HABS crew happened to examine the only fireplace with the single stone lintel and assumed that the remainder of the fireplace lintels were of similar construction. This is possible given the fact that lintels at Fireplaces FP2 and FP5 were concealed by sheet metal hoods.

This analysis contains specific information concerning the historic integrity and condition of mantles, masonry breasts, lintels, fireboxes, smoke shelves and chambers, and hearths for each of the existing fireplaces in the house. The following is a comparative table of specific properties for each fireplace.

MARK	**LINTEL TYPE**	**FIREBOX OPENING WxHxD (in.)**	**IRON BAR SIZE WxD (in.)**	**MANTLE TYPE**
FP1	Jack Arch & Iron Bar	56 x 39 x 25	0.56 x 2.75	None
FP2	Jack Arch & Iron Bar	46 x 32.5 x 15	0.56 x 1.625	1
FP3	Stone Lintel	50.5 x 30.5 x 17	None	1
FP4	Jack Arch & Iron Bar	46 x 31 x 13	0.56 x 2.5	2
FP5	Jack Arch & Iron Bar	40.5 x 24 x 17	0.56 x 3	1
FP6	Jack Arch & Iron Bar	37.5 x 23 x 15	0.56 x 3	1

Although the first and second floor brick hearths have been raised as a result of floor leveling work accomplished by the Wenzlicks in 1940, many of the bricks are believed to be historic with respect to the nineteenth century. Brick found to be finished with a dark red paint layer underlain by a layer of the characteristic dark green, applied in 1874 (see Appendix D, Paint Analysis), are believed to be historic.[264] There are also traces of sand and lime mortar on the brick. Examination of numerous samples of painted brick indicates the brick is hand-made. The low fired, soft mud brick are sand moulded and stick struck.[265] Hand-moulded brick was predominately produced in the United States until the advent of brick making machines during the latter half of the nineteenth century.[266] But, brickyards are still in business producing hand-made brick. Therefore, precisely dating the Main House brick is impossible without additional research of local brickyards.

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[263] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 36, and James Davis to the author, 18 March, 1993. While the article is factually flawed in many instances, the length in description of artifacts recovered from behind the brick seems to indicate that brick was present. However, the statement that the brick was placed during "...the Grant children's early youth" cannot be confirmed. James Davis did not recall his father mentioning brick removal from the fireplace openings.

Color chronologies for each chimney piece vary according to the stylistic desires of each space by the early owners or occupants. Beige was consistently used as a base color in the four historic chimney pieces, but this may have been a primer coat. Greys, browns, green, and black were used at various times thereafter during the nineteenth century. Except for the occurrence of dark green paint coatings, is impossible at this time to determine exactly when the individual paint coatings were applied without additional documentary evidence (see Appendix D, Paint Analysis).

Fireplace FP1
Basement 003

This rubble stone masonry fireplace was constructed when the West Wing was added to the Long House during the late 1830s (Figure 2.96). Although there is no written or photographic documentation on the use of the fireplace or Room 003, it is assumed that this fireplace at least served as a winter kitchen throughout a period of time during the nineteenth century.[267] Hand wrought iron gudgeons, sockets supporting a pot crane, are still anchored in the masonry at the north face of the firebox (Figure 2.97). There is one eyewitness account that the pot crane existed into the twentieth century.[268] Extensive smoke damage at the ceiling of Room 003 demonstrates that the fireplace has been heavily used and/or poorly draws a draft.

One curiosity of the West Wing and the Stone Building kitchen fireplaces is the absence of an oven for preparing bread, cakes, and other baked goods. There is no physical evidence that an oven ever existed within or adjacent to the fireboxes. Perhaps the crude nature of the rubble stone construction and/or the experience of the mason precluded the inclusion of an associated masonry oven. In the

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[264] WUTA, samples P106(E)-489, P103(W)-490, P201(E)-496, and P203(W)-498. The green layer is generally 2.5G 2/4 and the red 5R 3/10. It is believed that the red layer was applied by the Wenzlicks possibly after 1940. Sections of portland cement based mortar found in the hearth rubble fill of Fireplace FP6 had layers of the red paint. That hearth was repaired sometime after 1940 using some of the broken historic brick as fill. Many of the replacement machine-made bricks installed by the Wenzlicks have lugs at the back side. This brick type was also installed in the Stone Building floor when that building was converted into a garage around 1950.

[265] Karl Gurcke, *Bricks and Brickmaking, A Handbook for Historical Archaeology*, (Moscow, Idaho: The University of Idaho Press, 1987), 102-104 (hereafter cited as Gurcke, *Brickmaking*). The bricks have clearly been struck with a wooden stick rather than a steel blade. The painted brick measure 2⅛ inches by 4⅛ inches by 8⅜ inches, plus or minus ⅛ inch.

[266] McKee, *Masonry*, 44.

[267] Ladd, *Fireplaces*, 26. Ladd indicates that a "scullery" fireplace was sometimes located in the cellar or basement room where the dirty work of cleaning pots and pans was performed.

[268] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 34. "Hanging cranes evidence the primitive methods of cooking."

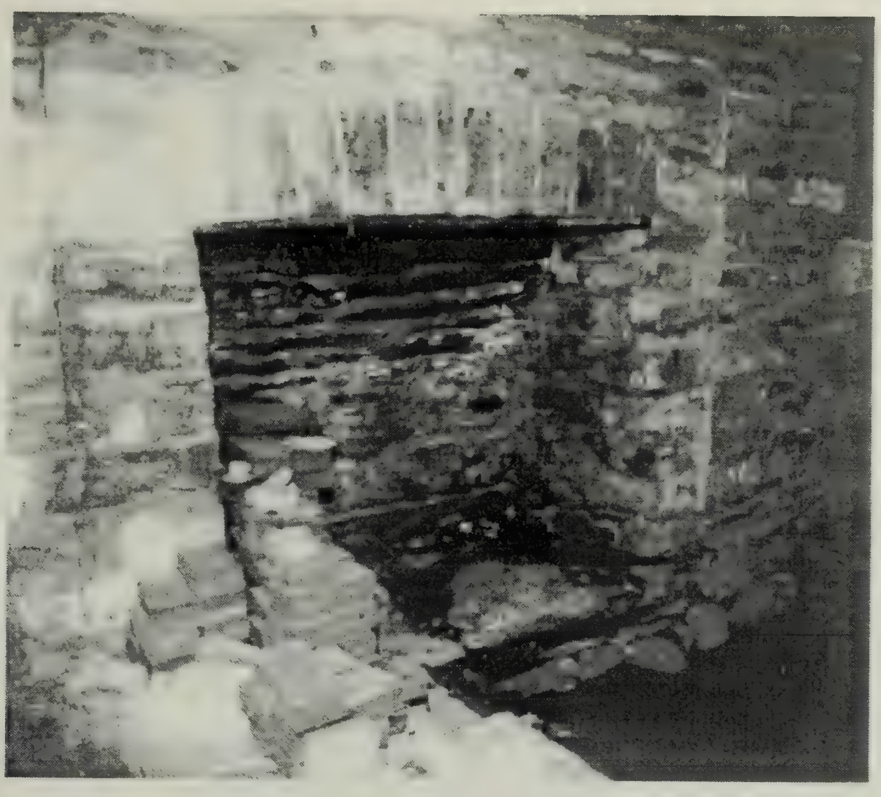

Figure 2.96 - Fireplace FP1, 1994. Located in basement room 003, this fireplace is believed to have served as a cooking fireplace until the Civil War. Brick removed from above the hearth in 1992 revealed the original stone hearth seen here. (Photograph by the author, ULSG collections).

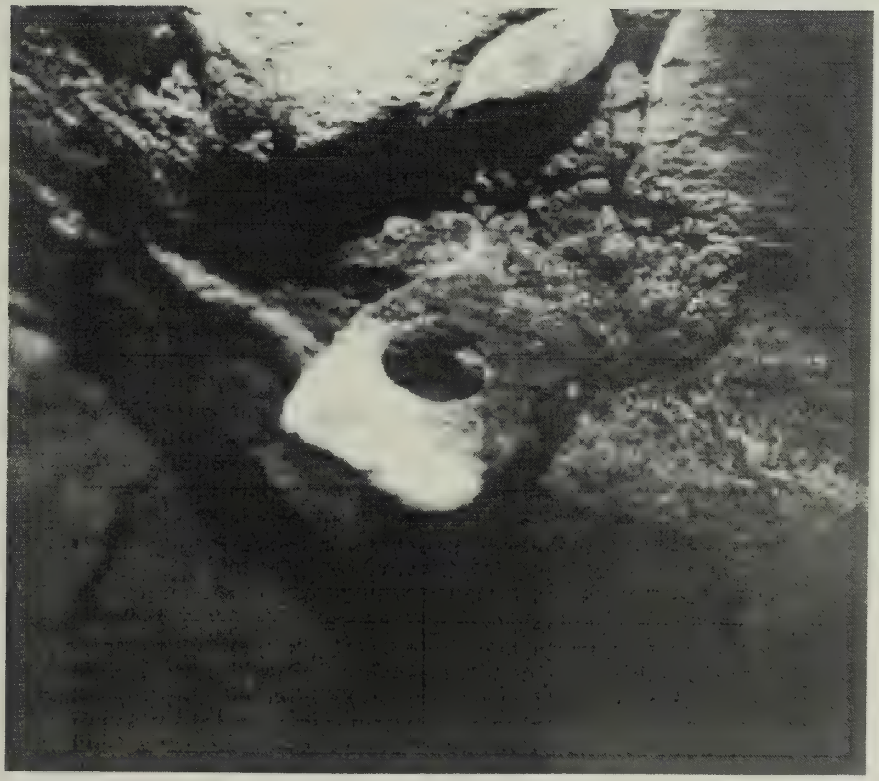

Figure 2.97 - Fireplace FP1 lower gudgeon, 1994. A pair of gudgeons was used to support and allow a pot crane to swing. The upper pintel is situated in the smoke chamber above the lintel. (Photograph by the author, ULSG collections).

absence of a built-in masonry oven the former cooks may have used tin reflector ovens, also referred to as "tin kitchens."[269]

There is no physical evidence that this fireplace ever had a chimney piece, but that can be expected given the utilitarian nature of this fireplace. The existing stone surface is in good condition although it has been heavily repointed with portland cement on at least two occasions. There is evidence of some stone replacement about 18 inches above the lintel. The stone has been whitewashed at the exposed face and its depth is much shallower in relationship to the surrounding masonry surface.

The firebox opening lintel is a composite of a tapered stone jack arch laid over an iron bar. Tool marks on the arch stone are more precise than surface marks on other stone of this fireplace indicating that the mason may have taken care to shape and set these stones. The lintel is in good condition.

The firebox is lined with stone, probably in place since its initial construction. The firebox is in good condition although there has been some repointing work with portland cement. The smoke chamber is of a considerable size; large enough for a person of medium build to stand within. The north flue of the chimney stack services this fireplace. The smoke chamber and shelf are in good condition although there is evidence of portland cement pointing.

The existing exposed hearth bricks were installed by the Wenzlicks and are pointed with a portland cement based grout, laid over a sand and gravel bed placed directly over the Room 003 concrete subfloor. The bricks are of contemporary manufacture. Live roots growing in this sand bed attests to the moist conditions in the basement. Most of the brick hearth was removed during 1992 archeological excavation work to verify the existence of any remains of the historic hearth and the original depth of the soil floor.[270] During that investigation, the original stone firebox floor was found about 6 inches below the brick. Stone rubble was found in the area of what can be considered a hearth, but there is currently no conclusive evidence that a hearth protruded into the room.

Fireplace FP2
Bedroom 104

This fireplace was constructed during the addition of the West Wing and probably served for space heating only, given the relatively small opening size (Figure 2.98). Except for minor twentieth century modifications, the fireplace has a high degree of historic integrity. This fireplace, and Fireplace FP3, are the only two in the house that were used during Albert Wenzlick's ownership.[271]

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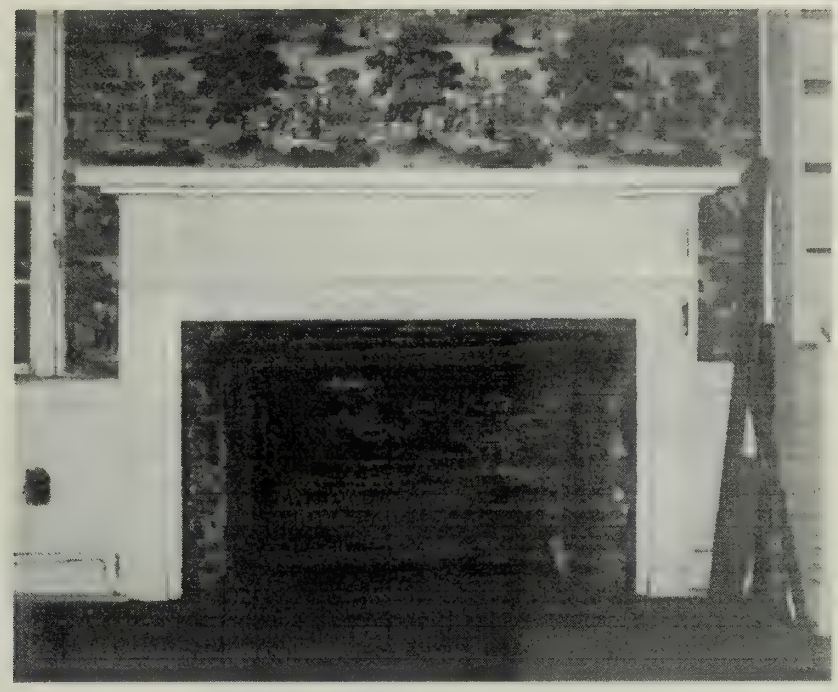
[269] Ladd, *Fireplaces*, 153. Examples of tin ovens are shown on pages 168 and 169 of Ladd's book.

[270] Bill Wenzlick to the author, 7 April, 1992. Wenzlick recalled that during his childhood the hearth was much higher than exists today, perhaps knee high to an adult prior to the floor being raised and finished with wood strip flooring.

[271] James Davis to the author, 18 March, 1993.

Figure 2.98 - Fireplace FP2, Room 104, 1994. The chimney piece may have been salvaged from the Room 101 fireplace during the 1830s. (Photograph by the author, ULSG collections).



One 1916 interior photograph of Rooms 103 and 104 shows that the existing chimney piece was extant at that time (Figure 2.19), although it is presumed to have been installed during construction of the West Wing around 1840 (See Historic Building Chronology, Phase III). In comparing the existing condition of the chimney piece seen in the background of Figure 2.19 it is found that plinth bases have been removed from each of the legs and the legs shortened in response to raising of the first floor level. Raised paint marks on the leg surfaces confirm that the plinths were previously extant.

The existing mantle stands about 2 inches distant from the masonry breast. The gap formed between the mantle and masonry is infilled by lightly painted 1 inch by 2 inch trim, which is nailed to the inside edge of the mantle opening. Upon removal of this trim, additional nail holes were found which indicates that trim had previously existed here. Examination of masonry surfaces behind the mantle revealed that the fireplace face is constructed about 2 inches west of the interior face of the vertical logs forming the walls. There is no indication that this mantle has been removed and reinstalled during replastering work as has occurred on all other mantles in the house.

Paint analysis reveals that a host of colors have been applied to this chimney piece. The early to late nineteenth century chronology featured beige, light drab, black, and light grey prior to the application of the marker color dark green (See Materials Analysis, Paint).[272] It is impossible at this time to determine exactly when the individual paint coatings were applied without further documentary evidence.

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[272] WUTA, samples P104(W)-131 and P104(W)-132.

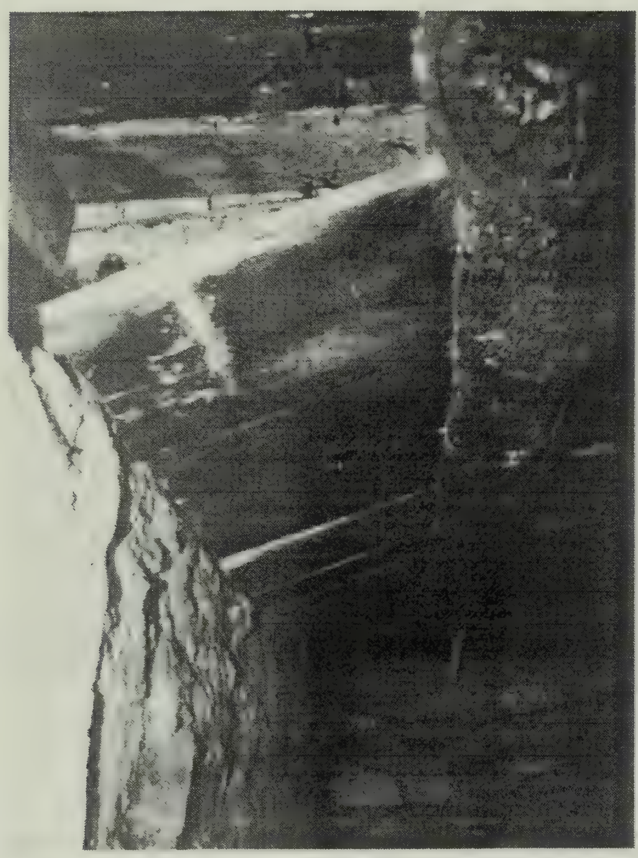

Figure 2.99 - Fireplace FP2 hearth undercarriage, 1994. The foundation masonry wall and the first log joist in the Room 104 floor system support diagonally set boards. Hearth brick is loaded onto the boards. (Photograph by the author, ULSG collections).

Comparison of this chimney piece with the other three historic chimney pieces in the house lends credence to the theory that this one was moved from Room 101 when the West Wing was added around 1840. The base paint coat matches the base color found in the other historic chimney pieces. Paint layers thereafter are numerically and color consistent with schemes found on the other chimney pieces. The construction and detailing of all of the historic chimney pieces is virtually identical. Perhaps the Dents desired to place a chimney piece which was more consistent with the Greek Revival style for the time in the formal room of the house (See Fireplace FP4), and salvage the older chimney piece for use in an informal room.

A sheet metal mantle hood was also removed to inspect the lintel. The hood was fastened with wire nails and is shown on Figure 2.19. This hood and those on other fireplaces in the house were installed to provide a more efficient draft for fires. The hoods were probably installed by the Wenzlicks early during their ownership.

The lintel is a composite of a jack arch and iron bar. The lintel is in sound condition although it has deflected slightly. The mortar in the jack arch has deteriorated and piece of the bottom of the key stone is cracked.

The stone lined firebox is in good condition with little evidence of twentieth century repointing work. About one quarter of the firebox surface area is parge coated with a soft lime and hair mortar.

The smoke chamber and shelf are in good condition. A severely rusted remnant of a damper, probably installed by the Wenzlicks, was removed for inspection purposes.

Seen from the underside of the hearth exposed in the basement, the hearth is supported by tongue and groove 1 inch thick boards of random width (Figure 2.99). The east end of the boards are laid into a notch in the first log joist and supported at the west end by a masonry shelf.[273] These boards are fastened to the first log joist with cut nails. The boards are heavily smoke damaged and have been lightly attacked by powder post beetles, yet the boards appear to be in good condition.

A sand and rubble layer lies directly on top of the hearth support boards, followed by a layer of solid brick. The top of the brick layer is about 1 inch below the undersurface of the original floor boards. The bricks appear to have been salvaged as there is evidence of a soft lime based mortar still clinging to their surfaces. However, these bricks have been mortared in place with portland cement and, therefore, may have been installed by the Wenzlicks as fill material when they raised the first floor and hearth levels. Upon removal of one brick from the first floor hearth level, a concrete bed was found directly beneath the hearth brick. This concrete probably overlays the brick layer seen in the basement.

The exposed hearth bricks appear to be old but their age or origin of salvage is unknown. The existing hearth level is about 3 inches above the historic wooden floor level. Remnants still exist of a natural gas "fire log" piped through the hearth by the Wenzlicks. Paint analysis indicates that the top coat of red paint is underlain by a single layer of grey.[274]

At each side of the hearth at the underside of the historic floor there are a series of large cut nails driven through the floor boards; five at the north side and four nails at the south side. The reason these nails were driven in those locations may not be known until the top floor is removed.

Fireplace FP3
Dining Room 103

This fireplace was constructed with the Long House and is documented in one photograph taken in 1916 (Figure 2.19). The fireplace is unusual in a few aspects when compared with other fireplaces in the house (Figure 2.100). The lintel is constructed of a single stone, whereas all other fireplace lintels are of a combination jack arch and iron bar composite. The opening is slightly wider in comparison with Fireplaces FP3 and FP4. It is possible that this fireplace may have been used for some light cooking functions although the existing fire box size and depth is insufficient to comfortably accommodate cooking operations for a sizable family. There is no evidence of pot crane fixtures. Of course, the wider opening may not have existed until Wenzlick occupation. There

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273. John I. Rempel, *Building With Wood* (Toronto: University of Toronto Press, 1980), p. 113. Although Rempel's example is from a house in Ontario, Canada, the illustrated hearth support method is very similar to the Fireplace FP2 hearth. Rempel also explains that this was a very common construction method.

274. WUTA, sample P104(W)-491.

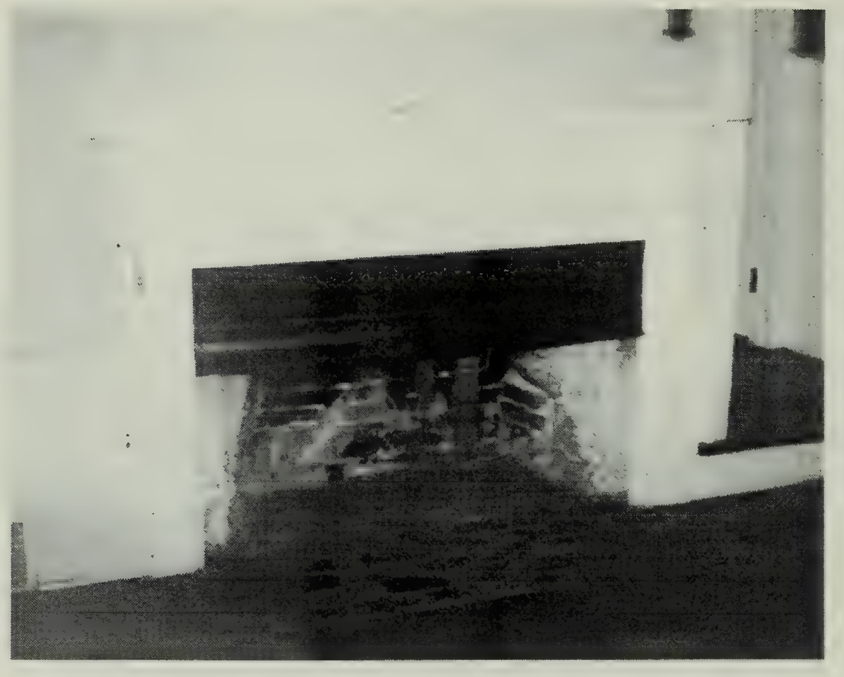

Figure 2.100 - Fireplace FP3, Room 103, 1991. This is the only fireplace in the house to feature a solid stone lintel. All other fireplaces have jack arches supplemented with an iron bar lintel. The sheet metal hood was installed around 1916. (Photograph by the author, ULSG collections).

is overwhelming physical evidence that much of the north portion of the masonry was modified to accommodate a furnace flue to service the basement furnace.

The wooden chimney piece is clearly shown in a 1940 HABS photograph (Figure 2.34). Although there is evidence that the existing chimney piece has been removed and reinstalled during replastering work, there is no evidence to suggest that the chimney piece is not from the original construction of the Long House. During 1940 Wenzlick renovation work, plinth bases were removed from each of the legs and approximately 3 inches of the ends of the legs were sawn off. Paint marks indicating the top edge of the plinths are still visible 2 inches above the hearth floor. By comparing paint samples from above and below the line it is shown that the Wenzlicks were indeed responsible for the removal of the bases.[275] Early paint hues were not very colorful; beige, black, beige, and light grey are colors that pre-date the dark green marker layer.[276]

Figure 2.34 indicates that the chimney piece was installed prior to original plaster installation as the broad surface of the frieze is almost flush with present wall finishes. The existing chimney piece stands proud of the plaster finishes by about 1 inch, indicating that the Wenzlicks removed the chimney piece during replastering work and simply nailed it back flush over completed plaster finishes. Paint marks at the top and side edges of the mantle confirm the original placement. The gap between the chimney piece and masonry breast in now more pronounced than shown in the Figure 2.34 photograph. At the time that photo was taken the gap appeared to have been infilled with mortar. The existing 3 inch gap is currently filled with portland cement mortar which is bonded to the masonry breast.

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[275] WUTA, samples P103(W)-89 and P103(W)-90.

[276] WUTA, samples P103(W)-88 and P103(W)-89.

The sheet metal hood shown in Figure 2.19 was installed prior to 1940, and was removed during investigation work to expose the lintel. The hood was severely rusted and may have actually directed hot air and sparks from wood fires between the wooden chimney piece and masonry breast. The concealed surface of the chimney piece is heavily smoke damaged and scorched.

As previously stated, the lintel is unusual in comparison to fireplaces elsewhere in the house. The 1940 HABS drawings record that all fireplace lintels were of a single stone which contradicts the existing conditions for the remainder of the fireplaces. The stone lintel measures 5 inches by about 12 inches in cross section. The lintel has been patched with concrete at midspan which raises doubts about its structural condition although there is no indication that the patch is in the process of moving or failing. It is unknown if the concrete is supplemented with reinforcing bars.

The Wenzlicks installed a clay flue liner for Fireplace FP3, and installed a flue opening (possibly lined with a clay liner) for the basement furnace. Each of these two flues are believed to have been installed in the single historic stone flue. This work resulted in partial dismantling and rebuilding of the firebox and smoke chamber. This flue may have been installed when the early boiler was placed in the basement by Albert Wenzlick around 1914. In comparing the existing firebox masonry to the 1940 HABS photograph (Figure 2.34), few changes have been made. This confirms that the flue modifications occurred sometime prior to the 1940 renovation work.

The back of the firebox is lined with pressed firebrick, a material inconsistent with the stone liners in other fireboxes in the house. One brick bears a "ST. LOUIS" brand.[277] The lower course of brick, is concealed behind the fireplace floor brick which indicates that the firebox brick work predates the 1940 raising of the floor level. Portions of the firebox retain a coating of soft mortar. Analysis of paint layers still clinging to the mortar reveals that the paint was probably applied by the Wenzlicks.[278] The firebox is in good condition although in need of repointing.

Removal of one brick from the northeast corner of the hearth revealed a concrete pad. The concrete was poured as a filler to raise the hearth in response to the raising of the first floor level. The concrete probably rests directly on the massive stone foundation of the central chimney stack. Inspection from the basement is impossible due to concealment of the underside of the hearth by duct work and structural elements. The hearth bricks are in good condition, although they are pointed with portland cement mortar. The 1940 HABS photo (Figure 2.34) confirms that the hearth

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277. Gurcke, *Brickmaking*, 300-304. A portion of the brand, or maker's mark, is concealed by mortar. Gurcke offers several "ST. LOUIS" brands of bricks manufactured in the 1920s through the 1940s. It is possible that bricks produced earlier are not listed by Gurcke.

278. WUTA, sample P103(W)-91. The first layer is a light blue that is also found in paint chronologies on fireplace mantel FP2. Application of the blue on FP2 post dates the dark green marker color and is, therefore, a Wenzlick coating.

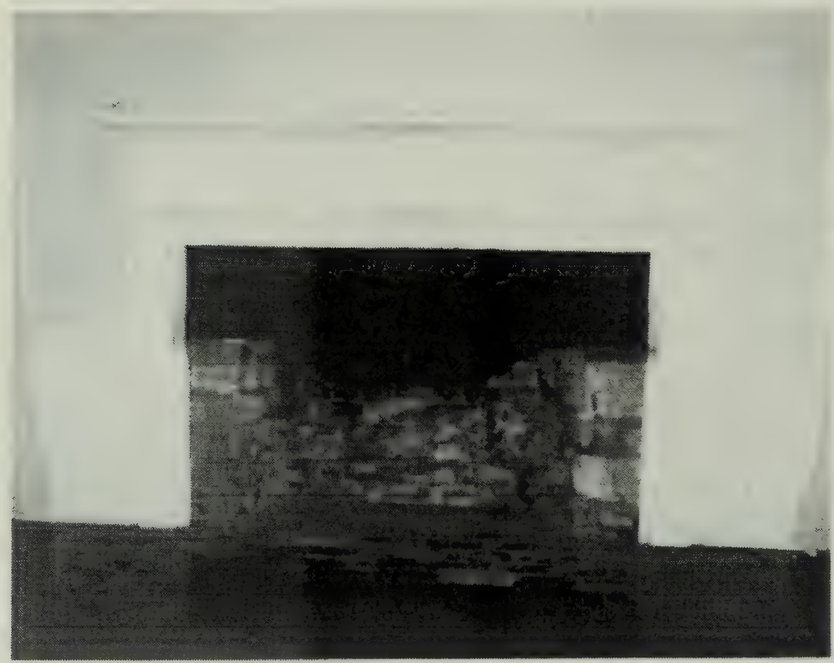

Figure 2.101 - Fireplace FP4, Room 101, 1991. This chimney piece replaced a Greek Revival styled chimney piece in 1940. The existing chimney piece is patterned from the typical style in the rest of the house. The Greek Revival chimney piece, which dated from extensive Dent renovation work during the 1830s, was unfortunately destroyed. (Photograph by the author, ULSG collections).

was paved with brick at that time, although it is unknown if the present bricks are from the historic hearth. Paint analysis shows that there are two layers of red paint divided by one of dark green.[279]

Fireplace FP4
Living Room 101

This fireplace was photographically documented on two occasions during Wenzlick occupation. More significantly, an early chimney piece was documented with a scaled drawing. In the 1940 HABS photo (Figure 2.33) of the east wall in Room 101, a simple wooden Greek Revival mantle is shown. In a photograph taken about 1949 (Figure 2.44), the Greek Revival chimney piece had been replaced with one currently on the fireplace. It is highly probable that the Greek Revival chimney piece replaced one which matched others in the Long House, and that the existing chimney piece in Room 104 came from Fireplace FP4 (See Fireplace FP2 analysis). The Greek Revival chimney piece may have been installed around 1840 concurrently with the front door given design similarities between these two millwork pieces.[280]

According to Bill Wenzlick, his father felt that the early chimney piece did not conform to the design of others in the rest of the house. Therefore, Delbert replaced the Greek Revival chimney piece with a reproduction matching the other chimney pieces in the house (Figure 2.101).[281] Apparently the mantle was stored in an outbuilding until it was salvaged for other uses in the late 1940s.[282] Fortunately, the significance of this millwork was noticed by a budding young architect who prepared a scaled measured drawing of the Greek Revival chimney piece prior to its disposal (see Appendix I, Previous Drawings and Sketches, Living Room Mantle drawing). Only three layers of cream and off-white colored paint indicate that the present chimney piece was installed by the Wenzlicks.[283]

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[279] WUTA, sample P103(W)-490.

[280] An original Greek Revival wooden chimney piece still exists in the St. Louis Soulard area at 1827 South 9th Street. The chimney piece was installed with the house's front door around 1840 (see Doors, 102-D1). Although stylistically similar to the former chimney piece on Fireplace FP4, its details and size are somewhat different.

[281] Bill Wenzlick informally to the author.

A sheet metal hood and steel damper were removed in March 1992 to access the lintel and smoke chamber. The fireplace opening is spanned by a jack arch and iron bar composite lintel. This arch differs in comparison to the West Wing fireplace lintels in that these voussoirs are composed of thin stone slabs laid bed vertical whereas FP1 and FP2 voussoirs are finished with tooled tapered limestone. The iron bar lintel strength is compromised to some extent by ½ inch diameter holes tapped for the purpose of fastening the damper to its underside. This lintel has deflected about ¾ inches but is in stable condition.

The side faces of the existing firebox are laid up with stone but the back face is lined with firebrick. This same brick can be seen in the 1940 HABS photo (Figure 2.33). The fire back is unusual in that it is pitched back rather than forward as is typically done to promote draft and reflect radiant heat into the room. The reason for this condition is unknown although the masonry breast surface also slopes back from the floor level. The brick may have replaced some of the historic stone lining as it spalled from the heat of fire. The smoke chamber and flue are in good condition although heavily coated with creosote.

This fireplace was converted from wood to natural gas fuel as evidenced by a gas valve projecting from the fireback. The gas line runs underground outside the east elevation of the house to a feeder line serving the workshop.

The brick hearth has been totally rebuilt as evidenced by the exposed concrete slab as its underside in the basement. The slab extends beneath the firebrick at the back of the firebox. A newspaper page imbedded in the slab dates to January 23, 1952. Caution must be taken for any future work on this hearth as it is strongly suspected that the concrete slab plays a role in structurally supporting the chimney girt and summer beam at the first floor level.[284] Some original brick was salvaged and installed in the hearth as evidenced by the dark green layers of paint. But the bulk of the hearth brick was manufactured during the twentieth century. It cannot be confirmed through the 1940 HABS photograph that the hearth was in fact brick, as a pile of debris obscures the hearth in the image (Figure 2.33). Green topped by red are the only two layers of paint found on the older brick.[285]

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[282] William Hayes to the author, 26 March, 1992. During high school in the late 1940s, Hayes worked as a grounds keeper at White Haven and assisted his father in some of the contract carpentry work at the site. Hayes developed an interest in early St. Louis vernacular architecture at that time and fortunately had the presence of mind to document the early mantle and save the drawing. The mantle was eventually dismantled by his father to use the wood in other carpentry projects.

[283] WUTA, sample P101(E)-168.

[284] See Structural Framing Systems, Structural Condition, Room 101 for further information concerning the summer beam to chimney girt joint.

Fireplace FP5
West Bedroom 203

There is no historic photographic documentation for this fireplace, yet there is no physical evidence to deny that it is historic. The chimney piece design is consistent with that of other chimney pieces in the house (Figure 2.102). The chimney piece has been removed and reinstalled as evidenced by the presence of metal lath and plaster feathered on the masonry breast surface, brought in from the surrounding plaster walls. Otherwise, this chimney piece has a high level of historic integrity as evidenced by the layers of paint consistent with early millwork throughout the house. The chimney piece had early colors of beige, medium grey, black, and medium grey.[286]

As with other chimney pieces in the house, this one was reinstalled on top of wall finishes replaced in 1940, rather than set into the plaster finish. The result is an increased gap between the chimney piece and masonry breast which led to a haphazard attempt to conceal the gap with plaster. The gap is presently 3½ inches wide.

By bending back the plaster and lath at the lintel, an early horizontal piece of wood framing set on a masonry shelf formed about 18 inches above the bottom of the lintel can be seen. The function of this piece is unclear but may have served as furring for the historic wood lath. The lintel is similar in construction to Fireplaces FP4 and FP6; a composite of thin horizontal bed laid stones in a jack

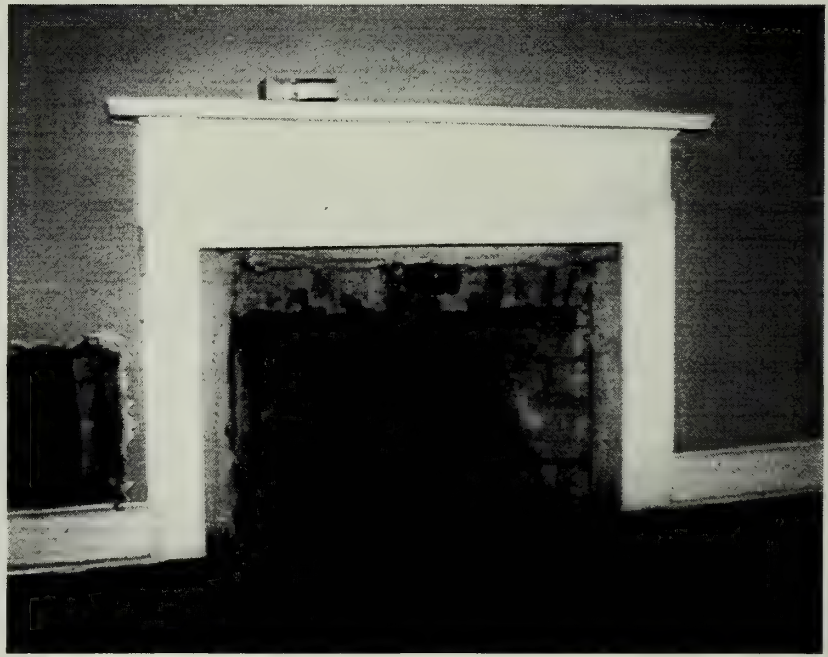

Figure 2.102 - Fireplace FP5, Room 203, 1991. The fireplace and chimney piece is historic to construction of the Long House. However, the collapsed central chimney stack filled the smoke chamber with rubble. This may be the only fireplace in the house to have a unmodified hearth base. The base consists of almost pure lime onto which the hearth masonry was laid. (Photograph by the author, ULSG collections).

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[285] WUTA, sample P101(E)-489.

[286] WUTA, samples P203(W)-256 and P203(W)-257.

arch over an iron bar. The lintel is in good condition although portland cement mortar has been smeared on some of the stones and over the lintel. This mortar is easily removed.

The stone lined firebox is in good condition although there is a small amount of portland cement repointing work. A large quantity of stone has collapsed into the smoke chamber from the wythe between the flues near the chimney crown, and therefore the condition of the smoke chamber cannot be assessed.

The hearth is currently paved in brick, although it is unknown if these are historic with respect to the nineteenth century. Only one layer of dark red paint was found on the hearth.[287] Beneath the brick is a 2 inch layer of cinder and coal filled concrete over a layer consisting of 2 inches of sand mixed with plaster, portland cement mortar, and gravel. Directly beneath the sand mix layer is a dense, 2½ inch thick layer of almost pure lime.[288] It is unknown if this lime bed is historic, but if brick were laid on the lime bed, the top of the brick would be flush with the historic wooden floor level. The lime bed is quite unusual and no references could be found for this construction technique. Extreme care should be taken with this hearth during any construction work to preserve the lime bed for future study.

Fireplace FP6
East Bedroom 201

A 1940 HABS photograph is the only photographic documentation that exists for this fireplace (Figure 2.35). The fireplace is shown prior to floor raising, and clearly shows the brick hearth, stone lined firebox, and chimney piece. The existing chimney piece matches that shown in the 1940 HABS photograph (Figure 2.103). Paint analysis suggests that the chimney piece is of early origin as evidence by the quantity of paint layers and palette of colors. Early color schemes included beige, rosy brown, brown/grey, and black.[289] The chimney piece may have been removed and reinstalled during 1940 wall finish replacement work as evidence by plaster and metal lath placed between the chimney piece head and masonry breast. However, the gap between the chimney piece and breast is narrower by as much as 2 inches when compared to all other chimney pieces in the house. In this case, the chimney piece was plastered into place rather than set against the wall finishes.

The lintel is a composite jack arch and iron bar constructed very similarly to fireplaces FP4 and FP5. The lintel is in good condition with little indication of modifications when compared with the 1940 HABS photograph, except for some portland cement repointing.

Portland cement mortar has also been applied to the masonry breast to fill the 1¼ inch gap between chimney piece and masonry, and repair spalled stone. In the 1940 HABS photograph it is apparent

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[287] WUTA, sample P203(W)-498.

[288] Arbogast, *Mortar Analysis*, 3.

[289] WUTA, samples P201(E)-209 and P201(E)-210.

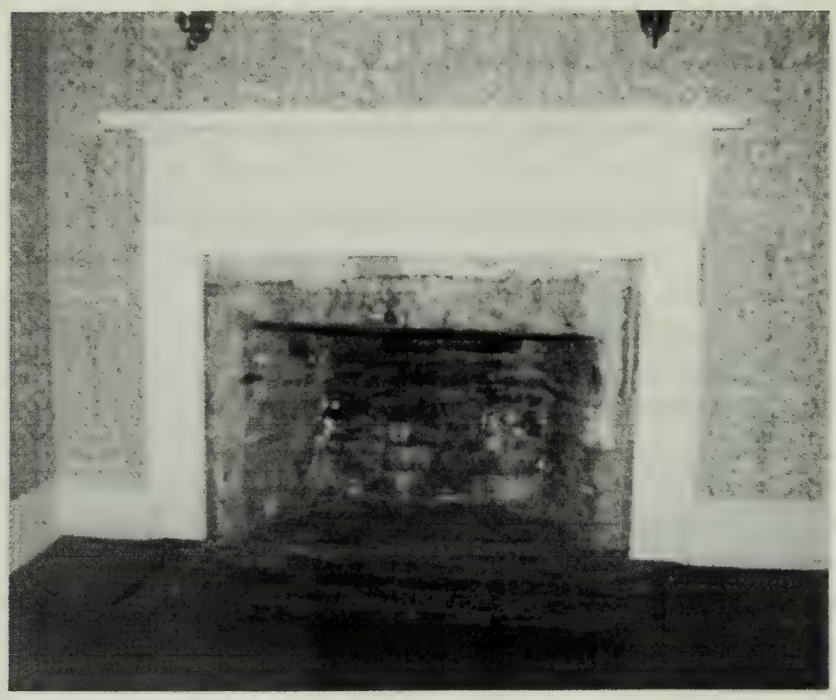

Figure 2.103 - Fireplace FP6, Room 201, 1991. Movement of the East Chimney Stack is manifested in this fireplace hearth. (Photograph by the author, ULSG collections).

that this same type of patch work was carried out with a different mortar mix in which the sand aggregate is clearly visible. This work may have been carried out by Albert Wenzlick.

The stone lined firebox is in good condition; some of the soft nineteenth century mortar is still visible in the joints. The remainder of the joints are pointed with a very hard portland cement based mortar. What can be seen of the smoke chamber appears to be in good condition. Three large stones wedged in the chamber are probably from the interior of the flue near the chimney crown.

The underside of the hearth was examined after ceiling finishes were removed from below in Room 101. The support consists of 1¼ inch thick boards bridging the space between the fireplace masonry and the chimney girt (Figure 2.104).[290] Some of the board supports are of the same material as the original floor finish. The boards are fastened with cut nails as are lath furring strips at the underside of the boards, and a ledger board at side of the chimney girt. A two by four ledger board laid flat against the masonry was installed during the 1940 Wenzlick renovation; there is no evidence of the original support method in that area.

The hearth is currently paved in a mixture of nineteenth and twentieth century brick. It is believed that the hearth was rebuilt in 1940 to boost it to the level of the raised floor. Physical evidence suggests that hearth bricks within the firebox were repaired or replaced since 1940, possibly in response to cyclical vertical movement in the stack.[291] All brick within the firebox matches the type found in the Stone Building garage floor. Removal of several bricks from the hearth revealed 2 inches of concrete over a fill layer consisting of several inches of sand, plaster, portland cement mortar, gravel, and brick pieces. Three bricks were found side-by-side mortared together at the historic floor level, and laid counter to the stretcher course of the existing hearth bricks. Examination of a 1940 HABS photograph showed that this hearth had a band of bricks laid side-by-side just inside the firebox (Figure 2.35). It is possible that the historic bricks were left in place as filler material upon installation of the new hearth. A pure lime layer was found beneath the hearth within the firebox, identical to the layer found beneath the Fireplace FP5 hearth. The lime layer may have been removed when the hearth was modified in 1940.

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[290] Rempel, *Building With Wood*, 113. The Fireplace FP6 hearth support is virtually identical to the example offered by Rempel.

[291] Bill Wenzlick to the author, 19 December, 1991. Stack movement also caused damage to wall finishes. See Room Finish Survey, Bedroom 201.

The hearth has settled by about ½ inches in relationship to the firebox and wood strip floor level. The reason for this is unknown, although depletion of the sand bed through the hearth board support joints and/or continued deflection of the chimney girt are potential causes.

Historic bricks in the hearth are finished with red brick similar to other hearths in the house. The brick is coated with dark green and red paint layers.[292]

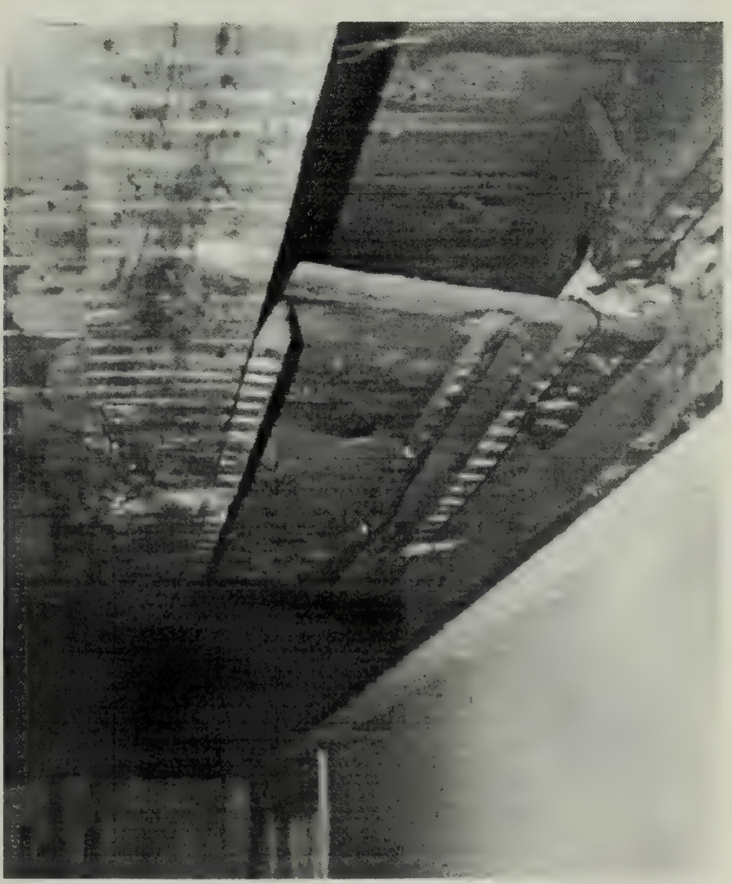

Figure 2.104 - Fireplace FP6 hearth undercarriage, 1994. This photograph was taken at the ceiling of Room 101. Ledger boards fastened to the chimney girt and framed wall provide support for the support boards. Most of the undercarriage assembly is believed to date to the construction of the Long House. (Photograph by the author, ULSG collections).

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[292] WUTA, sample P201(E)-496.

Doors

Door styles reflect the many renovation episodes performed on the house during its existence. Some door leafs have been moved between door openings in the house and modified in response to changes in room function and circulation. In some cases door openings have been created during the twentieth century where windows had previously existed. Historic photographic documentation of the interior is scant, particularly with regard to doors. Therefore, physical evidence is heavily relied upon to provide information on historic integrity for interior doors.

In general, the doors in the Long House are constructed of dowelled, fully mortised and tenoned styles and rails with six panels raised on one side only. A sampling of door materials revealed that most, if not all, Long House doors are constructed of yellow pine.[293] The panels are edged with thin applied moulding at the flush side; a detail consistent with construction methods developed around 1800.[294] Two doors in the West Wing are believed to be original to that addition and are constructed slightly different than with doors in the two story portion of the house in that there is no edge or applied moulding at the panels but the panels are raised at both sides. Doors 104-D1 and 104-D2 could have been constructed anytime after 1800.

During the 1940 Wenzlick remodeling work, the first and second floors were leveled with a new wooden floor over the original floor boards as much as 3 inches above the original floor level. In raising the floors but not the door frames, the door leafs were trimmed at their lower rails so that the doors would operate. In many cases the door trim had been cut to install the new floor beneath the butt ends of the vertical door frame trim. If the original floor level is to be exposed in the final treatment of the building, the large gap must be filled between the bottoms of the doors and vertical door frame trim and the original floor.

A mixture of nineteenth and twentieth century lock sets and hinges reflect repair and remodeling work over the history of the structure. The 1940 HABS drawings document a lever lock although there is no indication of the number that apparently were present at that time (See 1940 HABS Drawings, Sheet 3). Currently, there is only one lever lock on Door 103-D2 and the remains of another found at the east side of the house.[295] Several existing cast iron rim locks feature a "BLW" maker mark indicating that the locks were produced by the Branford Lock Works of Branford, Connecticut.[296] The patent date "July 21, 1863" is cast into each of the lock faces (Figure 2.105).

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[293] Alden, samples W-102N-13, W-104E-20, W-102N-35, W-103N-36, W-104E-63, and W-102W-65.

[294] George F. McNulty, "Henry C. Mercer and Dating By Mouldings," *APT Bulletin*, Vol. X, No. 4, 11. While this article addresses east coast millwork development, this door construction technique may have spread rapidly to other parts of the country due to its greater production efficiency over previous methods.

[295] The lock was found during removal of an underground oil tank in 1991. The lock is in the ULSG collection.

[296] Jane Peterson Bouley, *Lock Museum of America Hall of Fame, Thomas Kennedy-Manufacturer* (Branford, Connecticut: Lock Museum of America, 1990), information sheet. The Branford Lock Works (BLW) of Branford, Connecticut was incorporated in 1865 and sold in 1893. The company closed in 1905.

Figure 2.105 - Horizontal rim lock, Door 102-D3, 1994. Several doors in the house have these cast iron rim locks with the "July 21, 1863" patent date. It is unknown if these locks came from the house or were salvaged from other structures during twentieth century renovation work. Heavy paint coats were scraped from the lock to reveal the raised letters in this photograph. (Photograph by the author, ULSG collections).

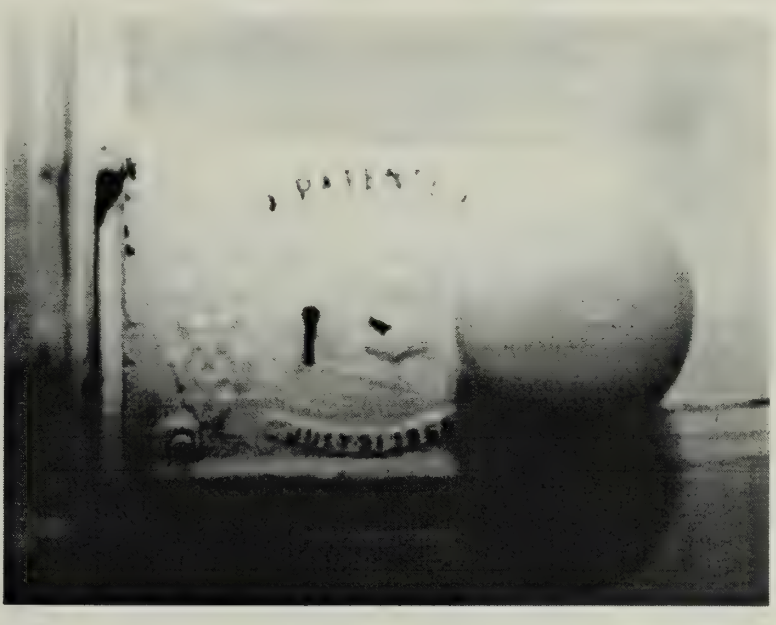
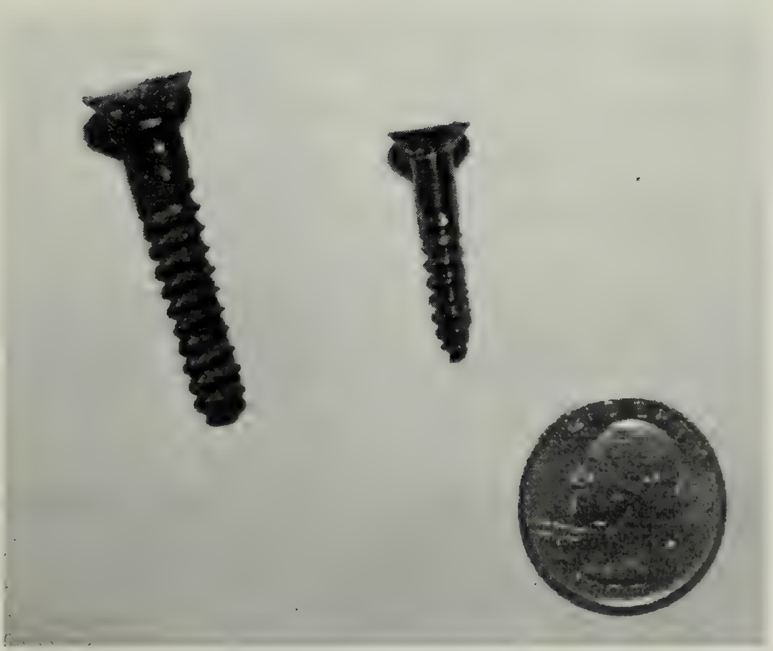


Figure 2.106 - Wood screw varieties, 1994. The blunt end screw at left was taken from a historic door hinge in the Long House. Blunt end screws were quickly superseded by the pointed, or gimlet, screws during the 1840s as seen on the right. (Photograph by the author, ULSG collections).



Since lock patents expired seventeen years after their issue, these locks could have conceivably been installed during Grant's ownership but there is no way of knowing whether the locks were installed new or salvaged from some other structure by the Wenzlicks.[297] The earliest hinges in the house differ in screw hole pattern from later hinges. This fact was used to determine the relative dates of hinge and door installation.

Examination of sample screws from existing locks and hinges revealed the presence of early unpointed, or blunt-point, wood screws. This fastener was generally superseded by pointed or gimlet screws in the United States after 1841 (Figure 2.106).[298] Comparison of screws can be used to date hardware installation. Unfortunately, many of the doors and their hardware have been moved around in the house making verification of placement integrity difficult.

A panel door found on the south elevation of the Ice House may have been salvaged from the Main House. This door matches the construction techniques of doors found in the two story portion of the house. The door was modified to fit the small opening; the top two panels have been sawed off and the bottom rail and styles planed. This door is in extremely poor condition.

The following door analysis will address physical evidence in terms of historic documentation, nineteenth century integrity, and existing condition by reference number for each existing door. Refer to Main House Existing Condition Drawings, Floor Plans, for door reference numbers. Elevations and details for each of the doors are also presented in the Existing Condition Drawings.

Basement Stair Door 002-D1

This doorway was installed with the construction of basement Stair S-3 around 1940.[299] The door style is consistent with late nineteenth to early twentieth century millwork. This five panel door is probably a salvaged item as evidenced by the original varnish finish beneath the top coats of paint, the mortise lock, and the steel hinges. The door leaf is in fair condition, while the hardware is in good condition.

Basement Restroom Door 002-D2

This doorway was installed with the 1940 construction of the small Restroom 002-B. It is possible that this door was salvaged from closets serving the 1940 HABS Room 6 bathroom or the HABS Room 2 bedroom given the fact that Delbert Wenzlick also moved the old bath fixtures from the second floor bathroom to the basement.[300] The style of the door and lock set are nearly identical to second floor bathroom Door 206-D1 which remained after the 1940 renovation work. The four panel door leaf is consistent with late nineteenth to early twentieth century millwork as evidenced by the machined, self-moulded styles and rails, original varnish finish, and steel hinges. The paint chronology features garish colors of pink, orange, and lime yellows, inconsistent with nineteenth century color schemes.[301] There is no evidence that the lock is not original to the door. All door components are in fair condition.

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[297] Thomas Hennessy, Curator, Lock Museum of America Letter to the author, 26 April, 1993. Patent Nº 39,289 was issued to H. Elwell of South Norwalk, Connecticut on 21 July, 1863.

[298] Edward C. Simmons, "The Hardware Trade," in Chauncey M. Depew, ed., *One Hundred Years of American Commerce, 1795-1895* 2 vols. (New York: D.O. Haynes & Co., 1895), 640.

[299] Bill Wenzlick to the author, 5 September, 1990

[300] Bill Wenzlick to the author, 19 December, 1991.

Cellar Passage Door 003-D1

This cellar passage served as the only entrance into the basement until construction of the internal basement Stair S-3 in 1940. The door opening was extensively modified in 1940 to provide greater headroom. The image of a very short door can be seen in the earliest photograph of the house taken in 1860 (Figure 2.3). However, high resolution scans of the area show eight thin, uniformly spaced horizontal slats across the opening, but no door can be seen. The slats may represent some type of barred door to allow ventilation but no animals into the basement kitchen, or a means of preventing access into the basement. The doorway is seen in early nineteenth century photographs which show the image of vertical board door (Figure 2.14 and 2.16). That door survived until 1940 when it was removed, a step-down entry constructed, and the present door installed. The clearest image of the board door occurs in a 1940 HABS photograph, Figure 2.27.

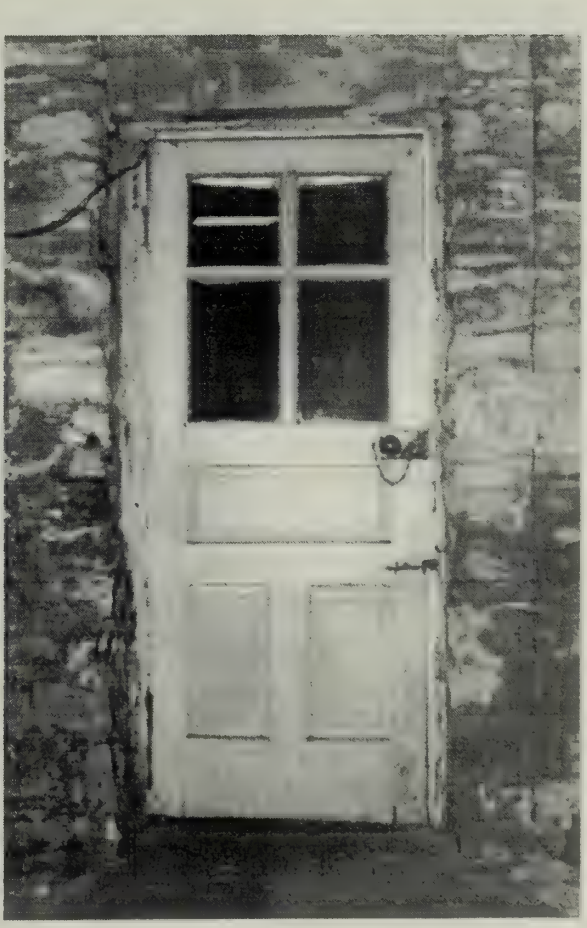

Figure 2.107 - Basement Door 003-D1, 1994. The length of this door opening was modified in 1940 to provide greater head room. The sill and head of the original opening was at the level of the bottom of the window of the present door and the foundation sill respectively. The origin of the door is unknown. (Photograph by the author, ULSG collections).

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[301] WUTA, samples P002N-359 and P002N-360.

Previous to the installation of the existing door and walk-down, the cellar passage was devoid of the existing exterior stone wing walls and step down, and the grade line was level across the foundation. Bill Wenzlick stated that while he was staying at the house during the 1920s and 1930s, the floor level of basement Room 003 was much lower than it exists today, and the stairs were internal to Room 003, rather than external as exists today.[302]

While there are no early photos of the interior condition of Room 003, Figures 2.14 and 2.27 show that the height of the board and batten door leaf stretched between the ground surface and the bottom of the siding skirt board, making a passage of about 4 feet in height. Stone added above the existing door head in 1940 was presumably intended to give a more uniform appearance to the foundation. The concrete wing walls are not integral with the stone foundation.

The board door image in Figure 2.27 reveals that it had been constructed of two wide horizontal boards hung with two strap hinges. Presumably there were battens at the interior side fastening the vertical boards in place. There is an image of a metal hasp at the south edge of the door. A strap hinge very similar to those seen in Figure 2.27 was found on site.[303] The jamb portion of the hinge is of cast iron which still retains the remains of three cut nails. The strap is doubled back over a loose pintle and has the remains of what are believed to be two nails with one empty fastener hole. The found hinge and the image of the hinges seen Figure 2.27 appear to be identical in every way.

The existing four light, three panel door leaf exhibits construction and moulding profiles unique to any other door in the house, and possibly dates from late nineteenth to early twentieth century (Figure 2.107). Only three coats of beige and white paint were found in the paint analysis.[304] The rim lock provides the only barrier to unauthorized entry. The door and rim lock are in fair condition.

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[302] Bill Wenzlick to the author, 24 February, 1992. Bill Wenzlick also indicated that there four or five steps down to the cellar floor level were encountered past the door.

[303] During 1992 investigation work at the north property line creek bed, the deteriorated remains of the strap hinge were found partially embedded in the muddy bank. Hinges of similar type can also be seen on stable doors in a 1940 interior photograph of the barn (see Figure 4.7).

[304] WUTA, sample P003W-355.

Basement Hall Door 003-D2
Basement Closet Door 003-D3

These identical varnished batten doors were fabricated and installed with the circa 1940s remodeling work of basement Room 003 and therefore have no nineteenth century integrity. However, their rim locks display a July 21, 1863, patent mark. Each of the locks are garnished with white porcelain knobs. The steel butt hinges date to the second half of the nineteenth century. The locks and knobs are in good condition and should be salvaged.

Basement Bedroom Door 005-D1

This doorway was installed during the 1940 addition of Room 005 by cutting a passage through the stone foundation wall between Rooms 003 and 005. The six panel door leaf detailing is identical to Central Hall Door 102-D2, and its 1½ inch thickness suggests that it too served as an exterior door at one time. The door's former location is unknown, but it may have been taken from one of the exterior doorways upon demolition of the Hunt Addition. Paint analysis of the door leaf indicates that the door has many coatings; five of which pre-date the dark green marker.[305] At least 2 inches have been sawed off the bottom rail. The frame and casing are completely contemporary.

The cast iron rim lock displays a "JULY 21, 1867" patent mark and is a second generation installation. From paint lines, it was determined that the original rim lock measured about 3 inches high by 4½ inches wide.

The existing brass butt hinges date to about the time of the 1940 remodeling work, but screw hole patterns from the previous hinges were found beneath the existing hinges and wooden shims. Mortise pockets were enlarged to accommodate the existing hinges but an impression of the original hinges indicates that they were 4 inches in length and the screw hole patterns are consistent with that of other historic doors in the house.

Basement Closet Door 005-D2
Basement Bathroom Door 006-D1

These identical doors were installed with the 1940 addition of Bedroom 005 and Bathroom 006. The raised six panel doors are consistent with millwork construction and design prevalent in the first half of the twentieth century; there is only one coat of paint on each of them. Their cast iron rim locks and porcelain knobs may have been salvaged from elsewhere in the house or from some other structure. There are no maker marks on the locks to be able to verify age, but the locks are in good condition. Each of the forged plated steel hinges certainly date to the mid twentieth century.

Living Room Doorway 101-D1

Physical evidence suggests that this doorway was added in response to the installation of the west living room wall around 1840 (See Room Finish Analysis, Living Room 101). There is no visible physical evidence at present to indicate that the existing frame at this doorway ever had a door leaf although the east casing was totally replaced during 1940 renovation work. Paint analysis of the east casting indicates that one coat each of olive and light grey are interspersed with numerous layers of cream and beige.[306] The west casing however contains the dark green marker color indicating that it was in place prior to 1913.[307]

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[305] WUTA, sample P005S-337.

Drawings prepared by HABS in 1940, and a drawing prepared by Lila Metcalf Wenzlick document the existence of a door leaf opening into Living Room 101 (see Appendix I, Previous Drawings and Sketches). The frame was deepened into Room 101 during 1940 Wenzlick remodeling work, in response to the installation of a thicker wall to accommodate duct work through the wall cavities. According to paint analysis, the east casing and frame extension are Wenzlick fabrications, but the remainder of the frame and west casing are historic.[308] The casing and frame have been cut at the new floor level.

Front Door 102-D1

This prominent front entry is stylistically consistent with the Greek Revival period of design which principally occurred between the 1830s and 1850s.[309] Physical evidence suggests that the door was installed after initial construction of the first floor. The existing door with side lights and transom can be seen in the earliest graphic documentation of the site (Figure 2.1). The clearest nineteenth century image appears in a photograph taken about 1883 (Figure 2.8). The door is constructed of white pine and is believed to have been installed by the Dents by 1840, during major renovation work (See Historic Building Chronology - Phase III).[310] The door and window surround were photo documented by HABS in 1940 (Figure 2.31).

This single panel door leaf matched the style and profile of a door that once graced a residential structure located in the Soulard section of St. Louis.[311] That structure is believed to have been constructed between 1841 and 1847. According to documentation prepared by St. Louis preservation architect Jack Luer, the panel profiles matched exactly and may have been milled by the same fabricator.[312] However, while the side lights and transom are stylistically similar, each of them differ slightly in profile and design. Another difference between these two doors is the

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[306] WUTA, sample P101(W)-188. This sample may have been contaminated by wall paints however.

[307] WUTA, sample P102(E)-07.

[308] WUTA, samples P101W-188 and P102E-007.

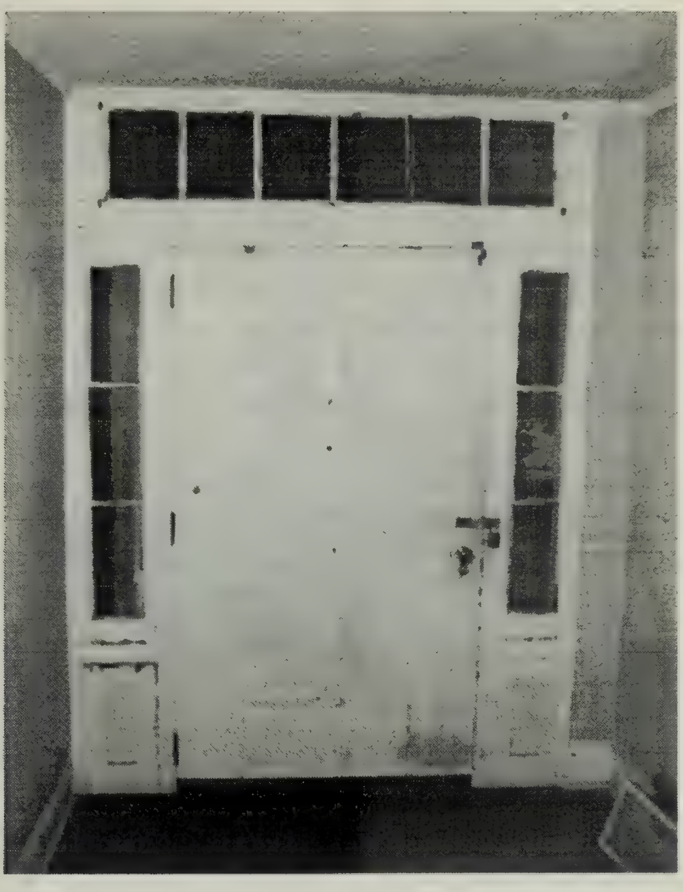
[309] Virginia and Lee McAlester, *A Field Guide to American Houses* (New York: Alfred A. Knopf, Inc., 1984), 182 (hereafter cited as McAlester, *Field Guide*).

[310] Alden, sample W-102S-64.

[311] The house is located at 1827 South Ninth Street. The original door was unfortunately demolished during 1992 renovation work but the side lights and transom remain intact. An attempt was made to fabricate the new door to appear like the original.

[312] Jack Luer & Associates, "Restoration to 1827 South Ninth Street," construction drawings, Job No. 87001, (16 September, 1987), Sheet A5.

Figure 2.108 - Interior view, Door 102-D1, 1994. The middle rail is believed to have been placed on the door to conceal a crack. (Photograph by the author, ULSG collections).



presence of a middle stile at the interior panel of Door 102-D1 (Figure 2.108). The profile of this rail differs from any other door profile, yet it is crudely fastened to the top and bottom rails and the panel with cut nails. A thin layer of paint was found on the panel surface beneath the stile suggesting that the stile was added not too long after the door was installed. Perhaps the butt joint between the two boards composing the panel separated or warped, necessitating the addition of the stile to cover the resultant crack.

Physical evidence suggests that modifications to the entry or entries and windows may have taken place. For instance, the alignment of this door is offset with respect to the second floor gallery door (201-D1) above. Also, the siding flanking the front door appears to have been modified to some extent (See Historic Building Chronology - Phase III). The door leaf and frame are in overall good condition with some damage rendered by the installation of a steel hasp at the interior surface.

According to second hand information relayed to William Hayes while he was a grounds keeper at White Haven during the 1940s, an original front door was stored in the house attic at that time (Figure 2.36).[313] That door was subsequently identified by William Hayes as being Stone Building

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313. William Hayes to the author, 10 December, 1991. This information was related to William Hayes by Lila Metcalf Wenzlick, second wife of Delbert Wenzlick, during his employment as a grounds keeper during the early 1940s. Hayes described the door prior to touring the Main House on 10 December, 1991, and subsequently identified the nine panel Stone Building Door D-1 as the door he remembered seeing in the attic.

Door D-1. The style and construction of this nine panel door leaf is consistent with that of many of the early interior doors (See Stone Building Door Analysis for further information).

Paint analysis evidence suggests that exterior surfaces of the door were painted cream to match the house when the door was initially installed. The second layer is best described as terra cotta, a color which may have been used to complement a medium brown found on the second floor posts and rails.[314] The second paint layer on exterior siding is a light grey, which would not complement the door's terra cotta.[315] This suggests that the front door may have been repainted while the house siding remained cream. The front door was also painted dark green prior to Wenzlick application of successive layers of off-white colored paint. Successive early interior surface colors include cream, light brown, medium grey, and marker color dark green.[316]

The existing mortise lock set is of twentieth century make by Corbin. The type of original lock is unknown as a large Dutchman at the interior face has obliterated all physical evidence of any first generation lock. That repair was probably made during Wenzlick ownership, as there are few paint layers coating the Dutchman surface. The lock and brass door knobs are in good condition although in need of maintenance.

The three cast iron, five knuckle, hinges appear to be original to the installation of the door and are in good condition except for numerous missing screws. Some of the counter bored holes which are missing screws may never have had screws. Blunt pointed screws were sampled from each of the hinges indicating that the door may have been installed prior to 1841. The door knocker was probably installed during Delbert Wenzlick's ownership.

For some unknown reason either one or the other of the raised wooden panels at the base of the side lights was installed upside down prior to 1920. In Figure 2.17 the bases and tops of the panels are asymmetrical with respect to one another. The same configuration is clearly seen in a 1940 HABS photograph (Figure 2.31). Since 1940 the west panel has flipped to match the east panel configuration. Bill Wenzlick recalled that former house occupant John Amocapone removed a panel in the 1980s to provide a passageway for his dog. Wenzlick reinstalled the panel.[317]

An early Wenzlick photograph shows a screen door hinged at the east jamb (Figure 2.15). The screen door was installed prior to 1913 and survived for at least several years (Figure 2.18). Because

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Lila Wenzlick told him that the front door was replaced during the 1840s, although this information is unconfirmed.

[314] WUTA, samples P102-D(S)-402 and P102-D(S)-403 for the front door, and samples P2(S)-389 and P2(S)-391 for post and rail.

[315] WUTA, sample P2(S)-387.

[316] WUTA, samples P102(S)-12 and -14.

[317] Bill Wenzlick to the author, 8 December, 1994. Wenzlick recalled that the east panel had been removed. However, from photographic and physical evidence it appears that the west panel was removed by Amocapone. The east panel was frequently kicked in by local boys to explore the house during St. Louis County ownership (Grant L. Mugge to the author, 10 January, 1995).

the screen door is present in a photo taken at the time Albert Wenzlick purchased the property, it is assumed that the door pre-dates Wenzlick occupation. A presently non-functioning jamb stop at the exterior side of the panel door was probably installed for the screen door. Although no formal paint analysis was made of the stop finishes, in-situ examination revealed base layers of dark and Paris green. The presence of the green paint indicates that a screen door may have been in place as early as 1874; but, the door seen in Figure 2.15 could have been a replacement. Paint is so thick on the existing frame that no visible evidence could be found of the screen door hinges or latch. However, Figure 2.20 shows images of hinges mounted to the south surface of the east door jamb. Figures 2.15, 2.18, and 2.20 show an image of a simple screen door with a pair of waist-high thin rails. A diagonal strip of wood in the top screen to provide lateral stability for the wide door. A small porcelain knob can be seen at the west style.

Central Hall Rear Door 102-D2

The existing doorway appears in motion pictures taken around 1928 and in 1940 HABS photographs. There is no physical evidence yet uncovered that the door is not in its original location with respect to construction of the Long House. The four upper wooden panels have been replaced with glass as evidenced by a 1940 Wenzlick photograph taken after demolition of the Hunt Addition (Figures 2.38 and 2.109).

Physical evidence of a former rim lock combined with fabrication characteristics indicates that the door is of early to middle nineteenth century construction. The construction and detailing of this door leaf matches very closely with that of basement Door 005-D1. Paint analysis strongly suggests that the door and frame are original to construction of the Long House.[318] Traces of terra cotta on an exterior panel sample indicates that the door may have been painted similarly to the front door (102-D2) for a time. Interior surfaces were painted in beige, light brown, and grey prior to application of dark green.[319]

The exterior jamb casings are about 1½ inches wider than the head casing which is atypical in comparison to other door and window casings. The reason for this anomaly is unclear, but may signal that previous repair or modification work had been performed on the door. Also, the photographs show no image of an exterior casing back band, and none appears until after 1940. Apparently, Delbert Wenzlick had the back band added to keep the style of the door casing consistent with surrounding doors and windows.

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[318] WUTA, samples P102-D2-512, 513, and 514.

[319] WUTA, samples P102N-40 and 41.

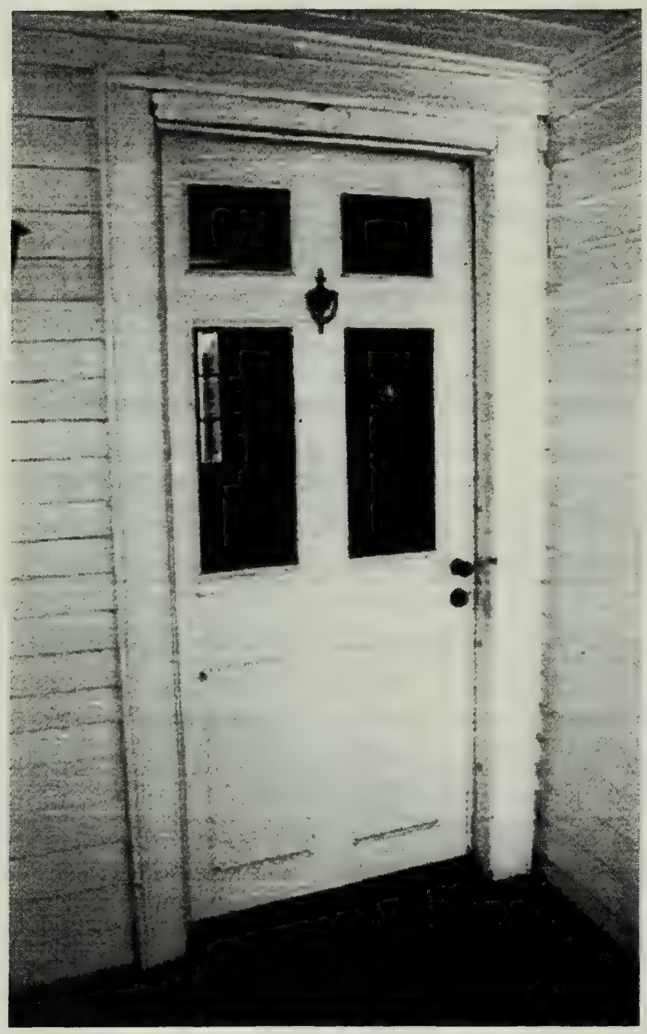

Figure 2.109 - Door 102-D2, 1994. This doorway provided passage to the back porch until 1950 when an enclosed breezeway was constructed. The top four panels have been replaced with glass, and the exterior casing backbands were added since 1940. (Photograph by the author, ULSG collections).

Overall, the door leaf is in good condition, with repair required at contemporary hardware installation locations. Restoring the door will require replacement of the glass with wooden panels. There may be extensive decay in the concealed areas of the head casing and lintel. Extreme structural problems induced by early water infiltration were found in the attic wall directly above the door. Fresh wear marks in the threshold at the hinge side and difficulty in operating the door signal that structural settlement continues to take place around the door. The quantity of caulk used to seal joints at the door head also signals that this door has been in a state of decay for some time

The mortise lock set is of recent manufacture and bears a "DEXTER" maker mark. There probably was a rim lock at one time but the door and frame are too damaged in the lock area to yield significant information. A sampling of screws from the cast iron butt hinges show that the screws are unpointed indicating the hinges to be of pre-1841 make. The hinges are in good condition.

Basement Stair Door 102-D3

This doorway functioned as entry to an under-stair closet door until the installation of the basement stairs by the Wenzlicks in 1940. Although there is no documentation, the door has probably served the closet since at least the late 1830s Dent renovation work, which created the center hall (see Historic Building Chronology, Phase III). The door leaf design and construction is an example of early doors found in the Long House. Paint analysis confirm that the door, frame, and trim are of nineteenth century construction.[320] Overall, the door and frame are in fair condition.

There are paint ghosts and holes bored through the style from former locks, indicating that the existing rim lock is at least a second, and perhaps third generation installation. One of the former rim locks measured about 3 inches wide by 3¼ inches high. The existing cast iron lock bears a "PATENTED JULY 21, 1863" maker's mark. The lock is in poor condition; it is fastened with clinched wire nails rather than screws. The glazed porcelain knobs are in good condition.

The cast iron butt hinges appear to be of original installation and are in good condition although requiring replacement of several missing and undersized screws. A sampling of existing screws showed them to be of contemporary make.

Stair Hall Doorway 103-D1

Physical evidence suggests that this doorway was salvaged from the former east wall of Room 103 and installed with the second east wall of Room 103 by 1840 (See Historic Building Chronology - Phase III). This doorway had a door leaf as evidenced by the Dutchmen placed in the hinge mortises and the screw holes and pressure points on the casing where the rim lock keeper had once been placed. HABS documentation completed in 1940 indicates the existence of the door leaf at that time (See 1940 HABS Drawings, Sheet 1).

Door 103-D4, located between the kitchen and dining room, may have been in this position. Comparison between the 103-D1 casing and the 103-D4 door leaf show that the hinge screw hole locations are identical. Paint analysis of 103-D1 indicates that the existing jamb and casing have nineteenth century integrity.[321] The existing jamb and casing are original and are in good condition except for the cuts that were made at the floor during installation of the 1940 floor boards. Pressure points on the trim indicate that the keeper from the removed rim lock measured about 5¼ inches in height. Removal of hinge mortise Dutchmen revealed that two episodes of hinges were installed on the casing, the second set required lengthening of the mortises from 4 inches to 5¼ inches. Screw hole patterns for the original set are consistent with the hinge type installed during Long House construction.

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[320] WUTA, samples P102W-21, -22, and -23, P002A-333 and -334.

[321] WUTA, samples P102W-18 and P103E-64.

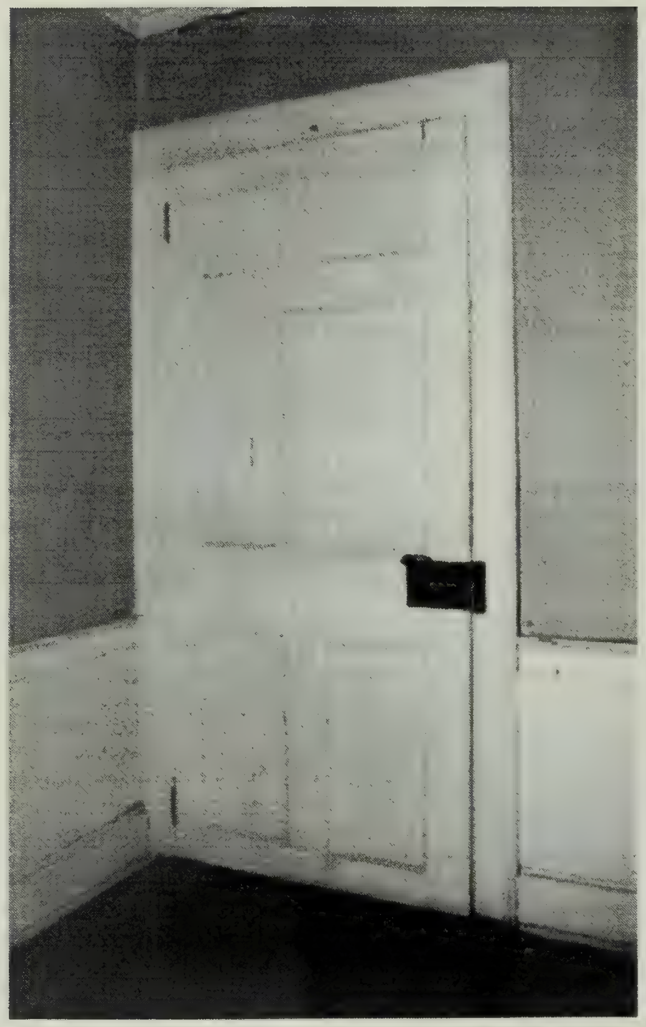

Figure 2.110 - Door 103-D2, 1994. The door and lock were installed at the time the Long House was constructed. (Photograph by the author, ULSG collections).

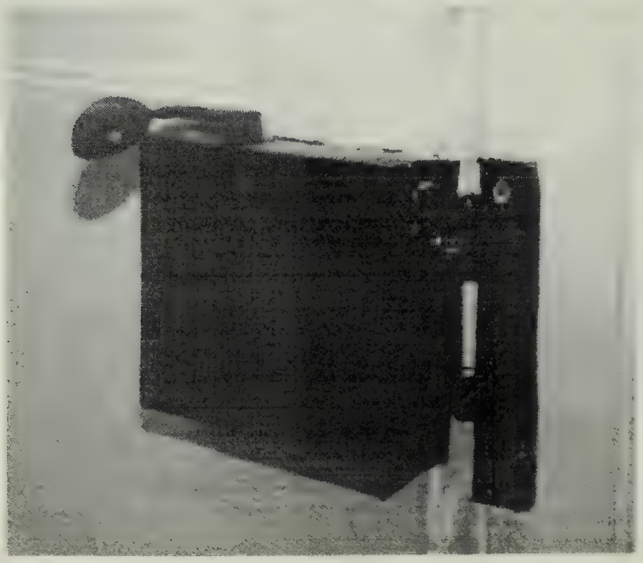

Figure 2.111 - Door 103-D2 lever lock, 1994. This lock is unique in comparison to other locks in the house. (Photograph by the author, ULSG collections).

Dining Room Door 103-D2

This six panel door leaf, which opens directly to the stair landing, is consistent with early nineteenth century construction methods and no doubt dates to the construction of the Long House (Figure 2.110). Paint analysis confirms that the door, frame, and original casing have high historic integrity.[322] The bottom rail of the door and the bottom of the trim in Room 103 have been cut to accommodate the 1940 floor raising. The casing has been broadened into Room 103 during 1940 Wenzlick remodeling work in response to the installation of a thicker wall to accommodate duct work through the wall cavities. However, the bottom of the casing appears to have been left intact. The door leaf does not close completely, possibly due to settling of the house.

The lock is unique to the house in relationship to other locks and is original to the door leaf (Figure 2.111). The cast iron dutch elbow lock features a lever rather than knobs as seen throughout the rest of the building. Dutch elbow locks were popular in the United States from 1750 until 1850.[323] A sampling of screws from the lock showed them to be unpointed and thus pre-dating 1841. Keeper screws are of contemporary make however. The lock is in good condition, although heavy paint layers are obstructing smooth operation. Each of the two cast iron hinges are original to the door although contemporary replacement screws were found among several randomly sampled screws.

Dining Room Doorway 103-D3

This door was constructed to provide access to the West Wing when it was added to the Long House. Prior to the West Wing installation, the area now occupied by the doorway was probably a solid exterior wall as evidenced by the builder's preference for avoiding the construction of any fenestration at the end walls of the Long House. Physical evidence of siding cladding the former west exterior surface of the Long House suggests that the siding was cut to accommodate this door. The siding can be seen from the basement.

At present there is no door leaf. In one of the few interior photographs of the house taken in 1916, a portion of this door and frame can be seen (Figure 2.19). The image reveals a paneled door consistent in construction with other early panel doors in the house. The door leaf was removed by the time the 1940 HABS documentation took place (See 1940 HABS Drawings, Sheet 1). Physical evidence of hinge mortise pockets and a Dutchman at the location of the former keeper further confirms the former existence of a door leaf. Comparison of the hinge mortise and screw pattern with original doors in the house reveals that the hinges were smaller in size and the screw holes laid out in an alternate pattern. The existing frame is in good condition although the bottom of the east side trim has been cut to accommodate the raised West Wing floor. From the remaining evidence at the frame and casing, the former door had a rim lock of unknown size, and hinges measuring 3½ inches in height.

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[322] WUTA, samples P103E-57, -58, and -59, P102N-38, -39, and -40.

[323] J. Randall Cotton, "Knobs & Latches," *Old House Journal*, 15:6 (Nov./Dec. 1987): 39.

Dining Room/Kitchen Door 103-D4

This door replaced a window during the 1940 Wenzlick remodeling work (Figure 2.112). The window is shown in 1940 Wenzlick photos taken during the Hunt Addition demolition (Figure 2.38), and is documented in the 1940 HABS first floor plan drawings (See 1940 HABS Drawings). Bill Wenzlick recalled that this door opening was once a window.[324] However, the raised six-panel door leaf and south face casing exhibits detailing and construction techniques consistent with that of the early nineteenth century, and in all probability was salvaged from Living Room Doorway 103-D1 during Wenzlick renovation work. The hinge hole pattern of the old hinges remaining on the door match those found on the Doorway 103-D1 casing (Figure 2.113). The door leaf has been modified into a double swinging door through substantial planing of the styles. At least 2 inches of the bottom rail had been removed in response to the 1940 floor raising.

Paint finishes have been removed from the door by the Wenzlicks. This was probably done in preparation for modifying the door to operate as a double swinging door. However, dark green paint residue left in joints and inside corners confirms that the door has a high probability of being historic to the Long House construction.

Paint analysis confirms that only the south face casing has historic integrity with respect to nineteenth century additions on the house. A layer of turquoise paint found on the casing compares favorably with a layer of the same paint found on the north casing of dressing room Door 106-D1.[325] Since 106-D1 has not been altered by the Wenzlicks, it is assumed that the 103-D4 casing came from some interior surface of the kitchen room constructed prior to 1875, or HABS Room 4 (see Room Finish Survey, Dressing Room 107).

Hinge mortises and screw hole patterns found in the south casing indicate that the casing was probably installed after construction of the Long House. The alternate screw pattern differs from Long House hinge screw patterns. The frame and north face casing were installed in 1940. The casing and frame are in good condition although the bottom ends of the south face casing has been sawed off to accommodate the raised floor level.

There is surface evidence of the previous existence of a rim lock on this door leaf. Although the door style has been heavily planed, screw holes are still present indicating the screw hole pattern of former hinges fastened to the door. This pattern and mortise length is consistent with that of Long House door installations.

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[324] Bill Wenzlick to the author, 25 October, 1991.

[325] WUTA, samples P103N-49 and P106S-148.

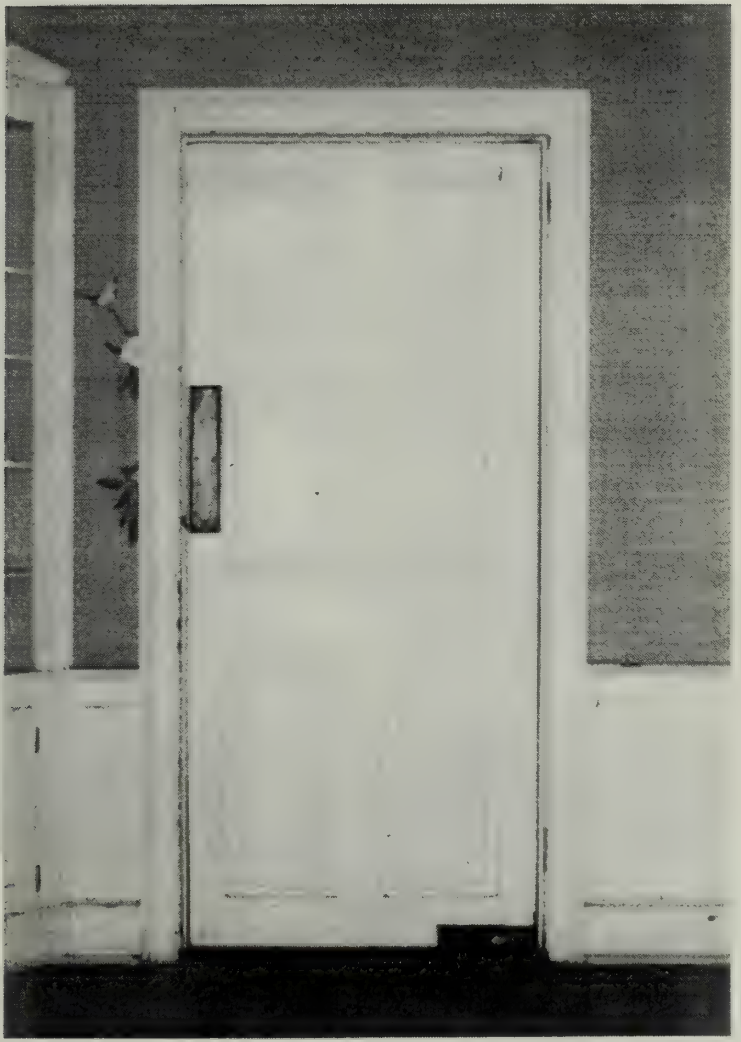

Figure 2.112 - Door 103-D4, 1994. This doorway is in the former location of a window. The door leaf was salvaged from doorway at 103-D1 and modified as a double swinging door between the dining room and kitchen. (Photograph by the author, ULSG collections).

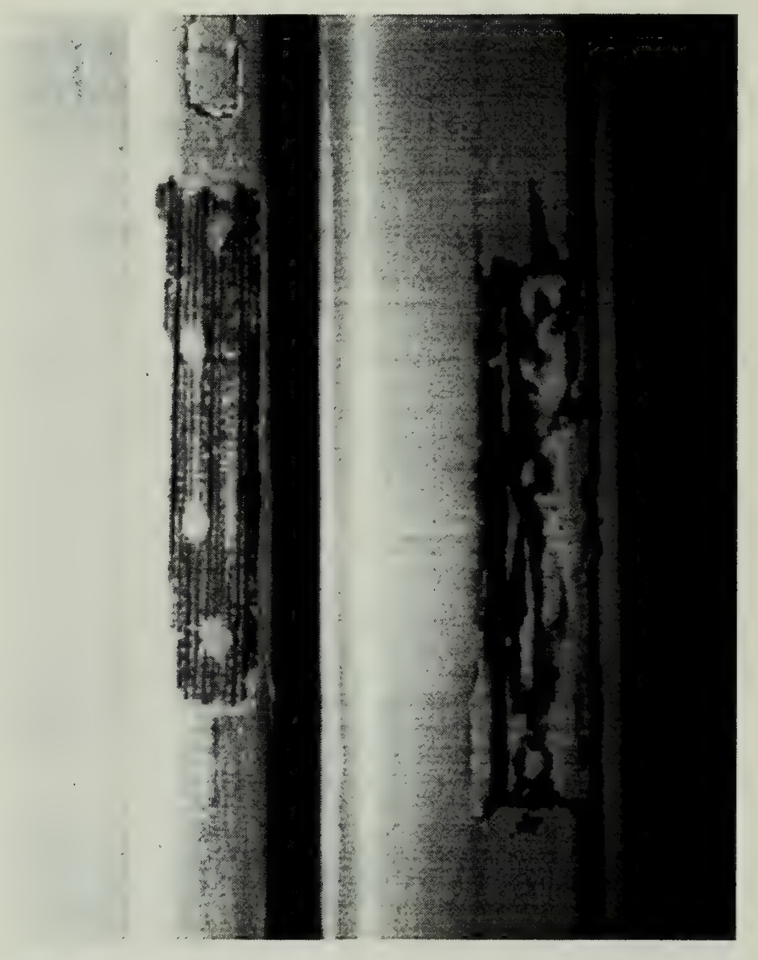

Figure 2.113 - Hinge holes, Door 103-D4, 1994. Hinge holes and mortises in the salvaged door and casing were filled when the door leaf was modified as a double swinging door. Heavy paint and Dutchmen were removed to expose the holes and mortises. Hinge holes in the door at left do not match the door's present companion casing at right, but match hinge holes of the doorway 103-D1 casing. The pattern of the door hinge holes matches that of early nineteenth century hinges found throughout the house. The south casing on this door is believed to have been salvaged from the old kitchen designated in the 1940 HABS drawings as Room 4. (Photograph by the author, ULSG collections).

Bedroom Door 104-D1

This door leaf, and that of 104-D2, are unique in relationship to other doors in the house. Each features six panels substantially raised on both sides and detailing that is consistent with early nineteenth century construction techniques. These doors may have been contiguous with the West Wing when it was joined to the Long House in the late 1830s. The size of both these doors is unusual in that their heights and widths are the greatest of any in the house except for Stone Building Door D-1 leaf. Doors of this width are usually reserved for exterior installations rather than interior partition openings. These existing doors may have been salvaged from elsewhere on the West Wing prior to joining it to the Long House.

The only historic documentation of this door is in a 1916 photograph taken from Dining Room 103 (Figure 2.19). Although only a portion of the door is shown at an acute angle, the door image closely resembles the existing door leaf, frame, and east face knob.

The door leaf no longer mates within the original stops but was modified to fit within new stops nailed to the inner surfaces of the original frame (Figure 2.114). This was accomplished by the Wenzlicks after 1940, probably in response to shifted walls due to structural settlement. The door leaf is in good condition except for several inches that have been removed from the bottom rail in response to the 1940 floor raising, and heavy planing performed on one or both of the edge styles in the door modification work.

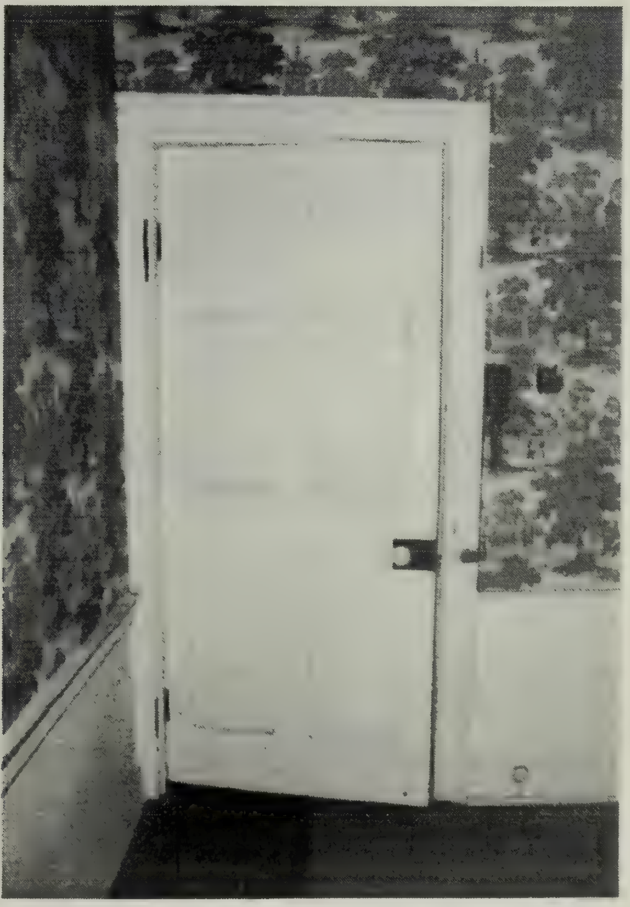

Figure 2.114 - Door 104-D1, 1994. The door leaf has been greatly modified to conform to the out-of-square frame. (Photograph by the author, ULSG collections).

The paint analysis indicates that the frame and door leaf have high historic integrity, although the new stops are of contemporary installation.[326] The frame stops and hinges have been moved toward the center of the casing, particularly at the head, to provide a plumb swing for the door. The hinge mortises were crudely chiseled resulting in damage to the jambs. The bottom of the south jamb was cut in response to the floor raising, but, curiously, the north jamb was left intact.

Paint mark evidence reveals that the existing rim lock is second generation and the original lock on the door measured 4⅜ inches wide by 3¼ inches in height. Pointed screws date the present cast iron rim lock as post-1841. The rim lock keeper was replaced with a strike plate commonly used with mortise locks. The lock is in generally good condition with only surface rust at the interior mechanism. The porcelain knobs are in good condition.

Removal of the original hinge mortise Dutchmen revealed that the present hinges indeed matched the screw hole pattern. One damaged blunt-end screw was found in the top hinge mortise. While all existing screws fastening the existing hinges to the casing are pointed, blunt -end screws still fasten the hinges to the door leaf.

Closet Door 104-D2

This door leaf is identical in detailing to the previous Door 104-D1, and is consistent with early nineteenth century construction techniques. The door leaf is in good condition. The frame and west face casing are most likely of early nineteenth century origin as indicated by results of the paint analysis.[327] However, the existing closet side trim is not original to this door system. The frame and closet side casing appear to run to the original floor level, but the casing at the bedroom side has been cut flush with the new floor level. Overall, the frame and casing are in good condition.

Paint ridges beneath the existing cast iron rim lock indicate that the present lock is second generation. The original lock to this door measured approximately 3¼ inches in height, or the same as the height of the rim lock ghost on Door 104-D1. Screws fastening the present lock to the door are pointed, indicating a post-1841 installation. The lock exhibits the maker mark "310" concealed on the bolt casing; the mechanism is in good condition. The porcelain knob at the bedroom side was once broken from the spindle and reattached with glue.

The cast iron butt hinges are similar in size and configuration to Door 104-D1. A sampling of screws showed a mixture of pointed and unpointed screws. The bottom hinge is broken and may require repair to sufficiently support this large door.

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[326] WUTA, samples P104AW-98, -99, and -100, P104E-106, -107, and -108.

[327] WUTA, samples P104E-111, -112, and -113, P104BN-135, -139, and -140.

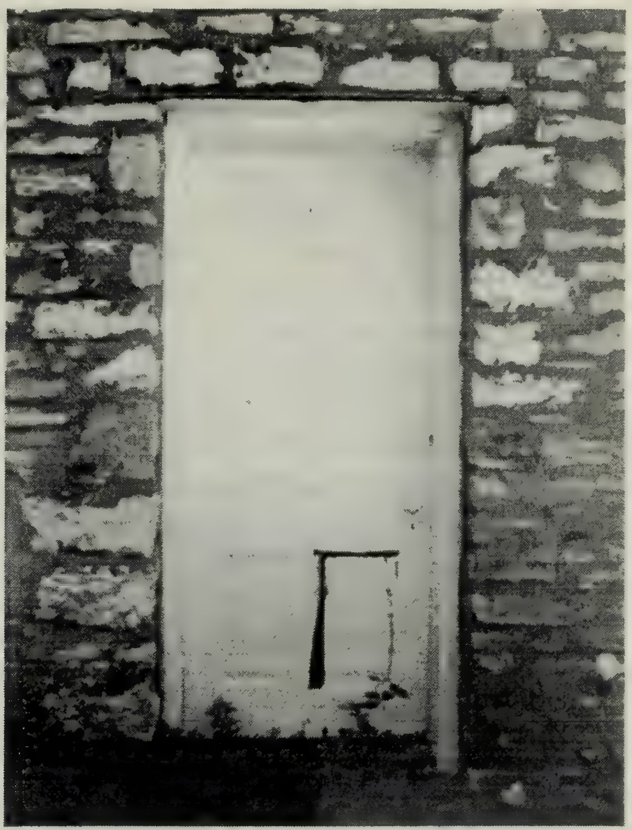

Figure 2.115 - Stone Building Door D-3, 1994. This door was installed on the Stone Building around 1950. Paint evidence suggests that this door was one of three which came from Room 4 in the 1940 HABS drawings. The hand and rim lock of D-3 indicate that this door was salvaged from Main House Doorway 104-D3. (Photograph by the author, ULSG collections).

Bedroom Doorway 104-D3

There is the possibility that this opening previously served as a window or as an exterior door in the West Wing. In an 1860 photograph of the house, no porch deck nor steps can be seen in the area of this opening (Figure 2.3). Therefore, it is surmised that this opening functioned as a window, prior to modification into a door. Another clue is the fact that the existing door aligns with Window 104-W1 directly across Room 104. The absence of vertical logs and mortise pockets at the underside of the plate directly above the door suggests that there has always been some kind of opening here. The presence or absence of a log mortise at the foundation sill beneath this door will confirm the opening type during later construction work around this door.

The 1940 HABS drawings and evidence of the remaining keeper and mortise pockets visible in the jamb indicates that there was a door leaf for this opening at one time. The frame is of nineteenth century construction as indicated by paint analysis.[328] The casing is in fair condition, but will require some repair work at the west jamb. The frame extends below the existing exposed floor surface, but the casing has been cut.

The north casing and frame contain a turquoise paint layer, a color believed to be unique only to the 1940 HABS Room 4 which has been extensively remodeled. The north casing is the only piece of in-situ millwork remaining from that room, and therefore the standard for determining the former location of turquoise finished millwork found scattered around the site. The door frame also features backband profiles unique to HABS Room 4. The south casing has a very simple profile while the north casing features a backband profile that matches remnants of the west window of HABS Room 4 (see Room Finish Survey, Dressing Room 106). The north casing has also been doubled up through the installation of a second casing with backband. Apparently, this was done to compensate for plaster thickness when Room 4 was added to the West Wing.

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[328] WUTA, samples P104N-102 and -103, and P106S-148.

Door D-3 presently on the Stone Building may have come from this opening (Figure 2.115). That door retains the characteristic turquoise paint layer found only on millwork from the 1940 HABS Room 4. Its hand is also correct for placement in the 104-D3 opening (see Room Finish Survey, Dressing Room 106). The remaining cast iron keeper on the Door 104-D3 frame pairs with a rim lock that is presently on Stone Building Door D-3. Physical evidence on the frame suggests that the door was hung by two butt hinges measuring 2 inches by 4 inches; each fastened with eight screws. The hinges presently on Stone Building Door D-3 appear to be of twentieth century make.

Bathroom Door 107-D1

A comparison of the existing layout of Rooms 106 and 107 with the same area shown in the 1940 HABS documentation indicates that the Wenzlicks had performed substantial remodeling work, including the raising of the floor level by at least 12 inches, relocation of the east wall of each of the rooms, and the replacement or relocation of windows and doors. The existing paneled door, frame, trim, and hinges of the subject opening are consistent with twentieth century construction and were probably installed during Wenzlick 1940 renovation work. However, the presence of a rim lock with unique dimensions when compared with rim locks elsewhere in the house suggests that this particular piece of hardware may have been salvaged from an old door and incorporated into the new door. The stamped steel hinges are of twentieth century make and in good condition.

Closet Doors 107-D2 and 108-D1

The louvered door, frame, and contemporary hardware on each of these doors were added during 1940 or 1950 Wenzlick renovation work, and therefore have no nineteenth century integrity. All components are in good condition, however.

Closet Door 108A-D1

This beaded board and batten door with three pane transom was found concealed within the south wall cavity of kitchen Closet 108-A in April 1993 during physical investigation work (Figure 2.116). Its discovery divulged previously unknown nineteenth century circulation patterns associated with the house. Diagonal wooden lath and plaster was fastened directly to the north face of the door, but the north wall of Hall 104-A was furred away from the south face. The door is essentially on the north elevation of the vertical log, West Wing portion of the house, and historically opened to the rear covered porch.

The ⅞ inch wide beaded boards are held together with two battens beveled on all four edges. A pair of five knuckle iron butt hinges are believed to date to the installation of the door; all of the screws are pointed. The cast iron rim lock exhibits a "BLW" maker mark and patent date "July 31, 1863" on the concealed and exposed faces of the lock (Figure 2.117).[329] Therefore, the lock may have been installed during Grant's ownership of the property. There is physical evidence that another lock or latch predated the present rim lock, but only three screw holes and overall measurements could be made. A white porcelain knob with iron shaft was found embedded in a blob of plaster at the base of the wall cavity. The closet side knob was cut from its shaft and the remaining assembly pushed into the wall cavity at the time the door was plastered over. The existence of a screw eye in the west jamb about waist high above the sill indicates that the door had a hook and eye at one time. All materials and hardware are in good condition.

The door was probably added at the time of, or soon after, the addition of the West Wing to the Long House. Given the fact that the door swung out from the early nineteenth century spaces, the probability that the door was already in place with the French Colonial structure prior to its move to join the Long House is doubtful. The only physical evidence yet found is that the cornice frieze board was cut to receive the west jamb casing. It appears that this was done after construction of the frieze board. A physical investigation performed during construction work of the presently concealed foundation sill and upper wall plate may shed more light on the age of the door.

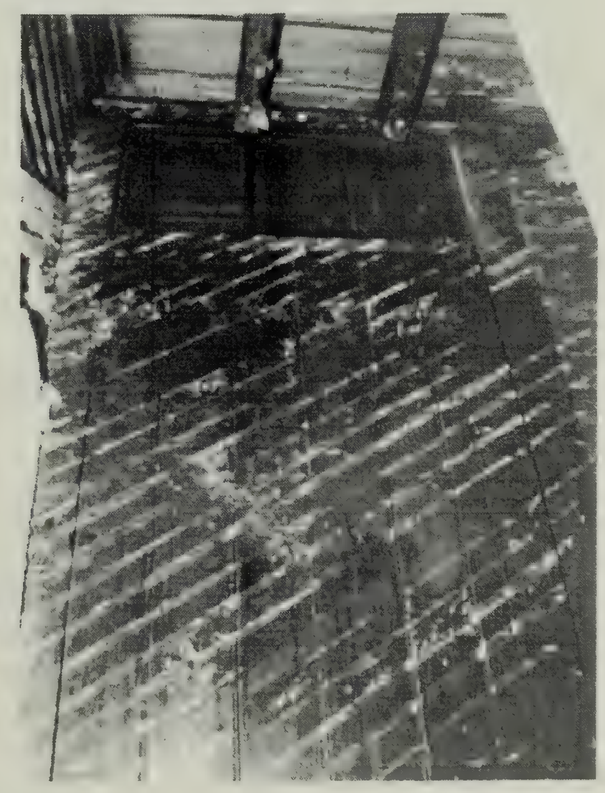

Figure 2.116 - Door 108A-D1, 1994. This board and batten door with three pane transom window was found concealed within a wall cavity in 1993. The both faces of the door have been concealed since around 1914. The dark green paint finish indicates that the door was last painted in 1874. (Photograph by the author, ULSG collections).

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[329] Thomas Hennessy, Curator, Lock Museum of America in a note to the author, 26 April, 1993. Whereas several extant examples of Branford Lock Works rim locks in the house are found with the 21 July, 1863, patent date, curiously there is no listing for a 31 July, 1863, patent date.

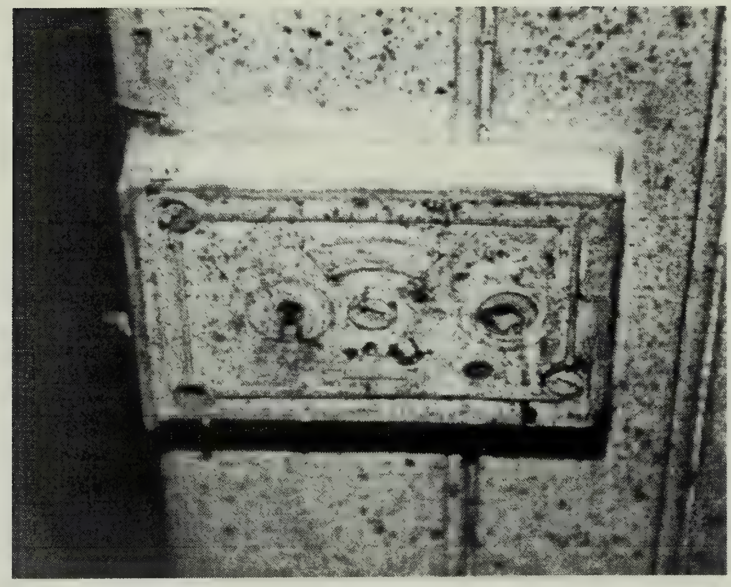

Figure 2.117 - Cast iron rim lock, Door 108A-D1, 1994. Physical evidence indicates that this is the second lock installed on the door. One porcelain door knob and shaft were found embedded in a plaster blob within the wall cavity. (Photograph by the author, ULSG collections).

Because the door is painted dark green and the surrounding siding emerald green, the door remained in use, or at least exposed until Albert Wenzlick renovated the house in 1914.[330] This is the only large, exposed area of the two-tone green color combination found in the house. Paint layering on the door suggests that installation of the door coincides with the addition of the West Wing.[331]

The hall or south face of the door was probably enclosed during Albert Wenzlick's ownership as there is physical evidence that a gypsum plaster finish pre-dates the finish now in place on that wall. The plaster Albert Wenzlick had installed was removed by Delbert and new plaster installed, but the horizontal wood lath was reused. Portions of the Albert Wenzlick plaster keys remain embedded between the laths and within the newer plaster.

Matching nail holes in the door and jamb indicate that the door had been secured on at least one occasion prior to the recent discovery of three nails fastening the door closed. Sawn diagonal lath nailed to the north surface of the door matches that installed in 1940 on the south wall of the kitchen to conceal exterior siding.

There is no evidence that a threshold ever existed; the base of the door merely butts the edge of the hall flooring. The jambs and head are plainly constructed with no moulding or other adornment. There is physical evidence that the door frame shifted in response to structural settlement, especially at the head where joints have separated. The existing rim lock was removed and realigned about one half inch toward the edge of the door when the door separated so much from the west jamb that the latch would not engage with the keeper. The repositioning of the lock seems to reflect an early phase of structural settlement. A second episode of settlement may have occurred during or shortly after Albert Wenzlick ownership while the door was nailed shut. The nail holes from that closing are now offset by about ½ inch. A second nailing took place around 1940.

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[330] Bill Wenzlick to the author, 16 April, 1993 and 8 December, 1994. Wenzlick did not recall seeing the pantry (north) side of the door during his pre-World War II stays at the house, but did indicate that Hall 104-A only had two door ways through Hall 104-A, 103-D3 and 104-D1. Wenzlick stated that a table was pushed up against the south wall of the pantry.

[331] David Arbogast, *Paint Analysis, Ulysses S. Grant National Historic Site* (Iowa City, Iowa: September, 1993), sample P108AS-598 (hereafter cited as Arbogast, *Paint Analysis*).

Based upon existing physical evidence, a reasonable chronology of the history of this door and associated transom has been developed. The door was probably installed by the Dents at the time the West Wing was joined to the Long House during the late 1830s. It is possible that the door was not installed until the rear porch was extended along the north elevation of the West Wing. But there is yet no conclusive information to support this supposition. A simple latch was initially installed but a hook and eye was added sometime later. The door opened out onto the rear porch or to steps. The door probably gave informal access to the house interior for slaves or servants serving food to the dining room from the basement and Stone Building kitchens. Later, a portion of the porch serviced by the door was enclosed for use as a pantry. Sometime between 1865 and 1913 the existing rim lock was installed but later realigned in response to settlement and separation of the door jambs and head. The door was nailed shut and both faces were plastered over soon after Albert Wenzlick's purchase of the property in 1913. The north face door knob was cut from the shaft and the south knob and shaft were pushed into the wall cavity prior to plastering.

Kitchen Door 109-D1

It is believed that this door was moved from the east wall of the 1940 HABS Room 5 to its present location when the kitchen area was constructed in 1940 (Figure 2.118).[332] There is no photographic nor other documentation for this door, however. The glazed door leaf is consistent with mid to late nineteenth century millwork. The multi-light glazing is of a combination of plate and heavily seeded cylinder glass. Paint analysis confirms that the door has a high degree of nineteenth century historic integrity, but the frame and casings are Wenzlick constructions.[333] Overall, the door is in fair condition and the frame and casing in good condition. A portion of the bottom of the door has been sawn off to accommodate a tighter opening.

The door bears a cast iron rim lock with the July 21, 1863 patent date and pressed brass knobs. The lock appears to be original to the door and is in poor operating condition. The five knuckle butt hinges are of sheet steel and probably date to the early to mid twentieth century. Perhaps these hinges replaced original hinges when the door was moved during Wenzlick remodeling work. A portion of the old, lower hinge mortise is concealed by a Dutchman.

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332. Bill Wenzlick to the author, 25 October, 1991, and informally on several other occasions.

333. WUTA, samples P109E-325, -326, and -327, and P110W-320, -321, and -322.

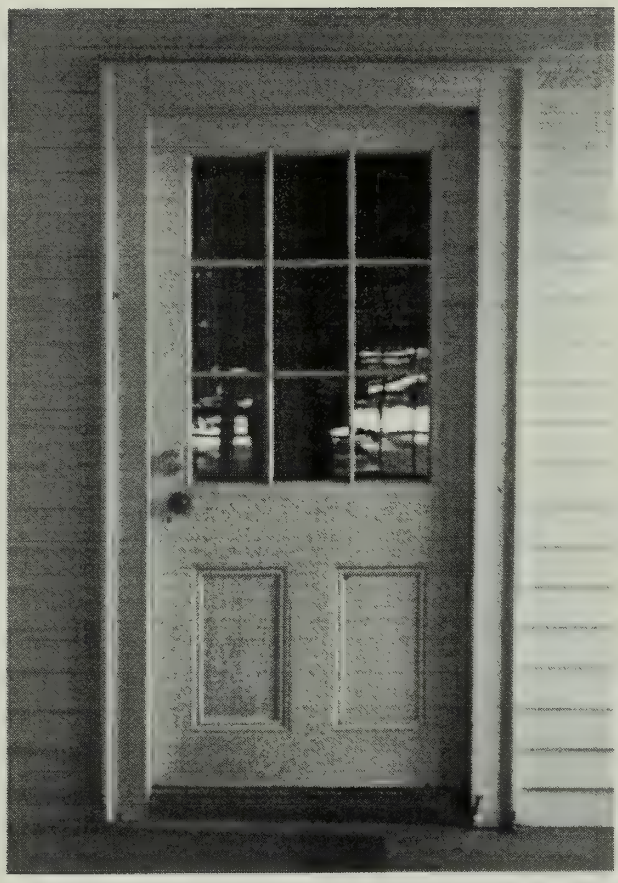

Figure 2.118 - Kitchen Door 109-D1, 1994. This door is believed to have been salvaged from Room 5 indicated in the 1940 HABS drawings. (Photograph by the author, ULSG collections).

Breezeway 110 Doors

All breezeway sliding and swinging doors were installed with the construction of the Wenzlick breezeway additions in the 1950s. The doors are in poor condition and bear no hardware predating installation of the doors.

Bedroom Door 201-D1

The design and detailing of this six panel door is consistent with that of the early nineteenth century (Figure 2.119). Unfortunately, it appears that most historic paint finishes have been stripped or have peeled from the door leaf. Only one paint sample from a door panel in Room 201 matched the color chronology of millwork in Room 201 (see Appendix D, Paint Analysis, Room 201).[334] There is no doubt that the door dates to the construction of the Long House. The door and frame are in good overall condition although the frame was deepened by the Wenzlicks to accommodate a wider wall for the installation of ducts. Unfortunately, the jambs and casing was cut to the level of the floor installed in 1940.

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[334] WUTA, sample P201W-226.

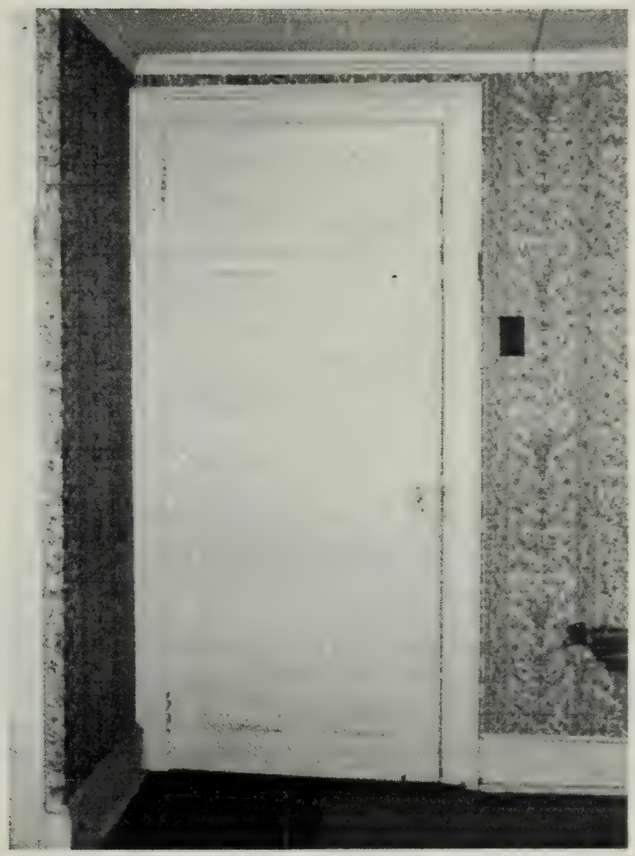

Figure 2.119 - Bedroom Door 201-D1, 1994. Door 203-D1 in Bedroom 203 is almost identical to this door. (Photograph by the author, ULSG collections).

The existing cast iron rim lock bearing the "PATENTED JULY 21, 1863" maker's mark is second generation, as evidenced by two keyholes bored at the hall side of the door. The existing lock and porcelain knobs are in fair and good condition, respectively.

The five knuckle cast iron hinges appear to be original to the door, although the casing hinge mortises are ½ inches longer than the 4 inch height of the hinge. Perhaps the door was realigned during 1940 renovation work to compensate for the head frame, which is over ½ inch out-of- square. The hinges are fastened with unpointed screws to the door and with contemporary pointed screws to the casing. The existing hinges are in fair condition.

Closet Door 201-D2
Closet Door 203-D2

These closets were added by the Wenzlicks in 1940. The doors leafs, frames, and hardware are all consistent with middle twentieth century construction. All components are in good condition.

Second Floor Porch Door 202-D1

The detailing and construction of this six panel door is consistent with the style of early interior doors. In all historic photographs taken of the front of the house, this door is always cast in shade and therefore details are difficult to discern. The six panel door leaf is in good condition overall. However, there are discrepancies between the paint chromochronologies of the door when compared to the remainder of the historic millwork in Room 202 (see Appendix D, Paint Analysis, Room 202).

This may indicate that the door was salvaged from elsewhere in the house but the period it may have been moved is unknown. Paint analysis and construction methods confirm that the door and casings possess a high degree of nineteenth century historic integrity.[335]

Paint ghosting indicates that the existing rim lock is second generation. The ghosting measures approximately 5½ inches by 3½ inches. The existing cast iron lock bears patent dates of "May 5, 1863" and "June 7, 1864" on its concealed inner surface. Each of the knobs are white porcelain. The existing lock is in poor condition.

The five knuckle cast iron butt hinges are of early installation as evidenced by their unpointed screws. However elongated casing hinge mortises indicate that the door was reset ½ inch higher than its original placement. The two hinges are in good condition although missing three screws.

Bedroom Door 203-D1

This door and frame is a companion to the Bedroom Door 201-D1 directly across the hall, and is believed to have high historic integrity with respect to construction of the Long House. The paint finishes may have been stripped from the door (see Appendix D, Paint Analysis, Room 203). The door leaf is in fair condition requiring minor repairs to one style and the middle rail. The jamb and casing were cut in 1940 to accommodate installation of the existing floor. A previous Dutchman repair was made to the casing around the keeper. Otherwise, the frame and casing are in good condition.

The cast iron rim lock bears the maker's mark "PATENTED JULY 21, 1863" and is second generation as evidenced by the present lock being installed upside down and scant paint ghosting of a previous rim lock. The lock set's operation is hampered by many coats of paint but the porcelain knobs are in good condition.

A pair of cast iron five knuckle butt hinges hang the door. These hinges are consistent with the early type of hinges found in the Long House construction. These are heavily coated with paint but appear to be in serviceable condition. One inch long unpointed screws confirm that these hinges are of an early make.

Bathroom Door 206-D1

This door is indicated in the 1940 HABS documentation as an entry into the second floor Room 3. According to Bill Wenzlick, HABS Room 3 served as a bathroom and was constructed by his grandfather around 1915.[336] Delbert Wenzlick's renovation work split this space into two bathrooms around 1940. This existing door may have been installed as early as 1915, and therefore its placement has little integrity with the nineteenth century. Paint analysis confirms that the door, frame, and casing have no nineteenth century integrity.[337] The door and lock set are very similar to that of basement restroom Door 002-D2, which was constructed by Delbert Wenzlick around the same time that the second floor bathrooms were installed. The brass plated steel hinges are consistent with twentieth century fabrication techniques. All door components are in good condition.

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[335] WUTA, samples P202S-299, -300, and -301, and P202D1S-372, -373, and -374.

[336] Bill Wenzlick to the author, 19 December, 1991.

Bathroom Door 207-D1

This six panel door was installed by the Wenzlicks with the 1940 renovation of the second floor bathrooms. This door may have been salvaged from one of two closets within the previous bathroom configuration (See 1940 HABS Drawings, Sheet 1). However, there are only three coats of paint on the door indicating that it has not been in place too many years.[338] The door is consistent with late nineteenth to early twentieth century fabrication techniques. The cast iron lock set may be of an earlier vintage; it is in poor condition. The steel hinges are consistent with twentieth century construction.

Attic Door 301-D1

This self moulded door with its steel mortise lock and hinges is consistent with late nineteenth to early twentieth century millwork fabrication techniques. The stairwell walls and enclosure are believed to have been installed by Albert Wenzlick to seal the attic from the second floor.[339] All door components are in good condition.

Windows

Extensive window modifications have been made throughout the life of the Main House. Over time, repairs, new window installation, movement or demolition of windows, the introduction of weatherstripping, and stylistic changes have affected the windows.[340] These modifications coupled with the need to accurately define treatment alternatives for restoration necessitate detailed analysis of each existing window. The following analysis will address each window in terms of available historic documentation, nineteenth century integrity, and existing condition by window reference number.

Twentieth century modification work common to all windows installed by 1900 included the cutting of reglets into lower sash for the installation of jamb and sill Monel metal flashing, and the installation of venetian blinds and curtains resulting in numerous fastener holes in casings. The Wenzlicks installed single panes of glass at all first floor windows to reduce air infiltration and

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[337] WUTA, samples P202E-291 and -293, P206W-278 and -278.

[338] WUTA, samples P201N-205, P207S-284 and -285,

[339] Bill Wenzlick to the author, 7 April, 1992. Wenzlick could not remember the attic stair enclosure being any different from what it is now, even during his childhood visits to the house.

[340] Bill Wenzlick to the author, 24 February, 1992. Wenzlick stated that 90-percent of the original windows contain original sash modified to accept weather stripping.

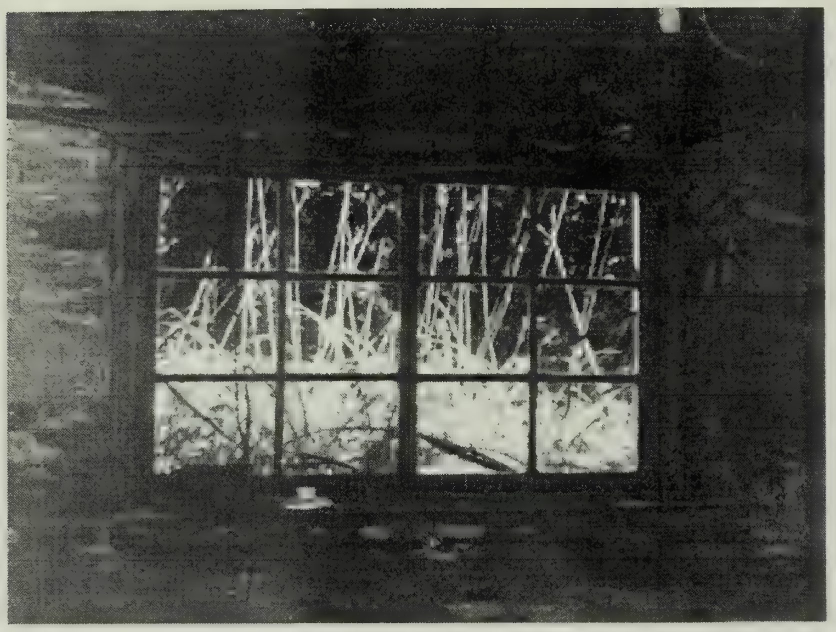

Figure 2.120 - Basement Window 003-W1, 1994. Paint evidence indicates that this window sash and frame has high nineteenth century integrity. The sash are inoperable because of thick paint coats. (Photograph by the author, ULSG collections).

provide an increased measure of security.[341] These heavy panes were held in place with thin wooden battens fastened to inside casing surfaces.

There is no documentation that the Wenzlicks installed replacement glass salvaged from other older structures in the area. However, the authenticity of all glass on the house is uncertain except in obvious cases where contemporary plate glass exists. Cylinder glass was probably installed in the house up until the late nineteenth century. Many cylinder glass panes remain in the existing historic windows. None of the existing double hung windows have any sash locks or pulls, nor is there any visible physical evidence that hardware existed at any time. Heavy coats of paint have rendered all of the windows inoperable.

001-W1

This window was uncovered when interior wall finishes were removed from Room 001. The opening was cast when concrete replaced the loose laid stone crawlspace foundation by the Wenzlicks around 1916 and therefore has no integrity with respect to the nineteenth century. The window is in poor condition as the grade beneath the porch is banked against the sash causing insect and fungal damage.

002-W1

The installation date of this window is unknown, as most if not all of the sash and frame components are of relatively recent construction. Brick integrated with the stone masonry around the jambs of the opening indicate that the jambs have been extensively repaired or perhaps the window added long after initial construction of the foundation wall. Paint analysis results suggest that the sash and frame are Wenzlick fabrications.[342] The sash was modified in 1992 to accept a horizontal flue. Otherwise the window is in fair condition.

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[341] Bill Wenzlick to the author, 8 December, 1994. Wenzlick indicated that "crystal" glass was installed in the windows. Crystal glass is an old standard thickness measurement between the thicknesses of double-strength and plate glass.

002B-W1

This entire window unit is believed to have been installed by the Wenzlicks. There is no physical evidence that masonry surrounding the window has been modified, so the window opening may be original to construction of the Long House. Paint analysis confirms that the few coats of paint contain no nineteenth century colors found throughout the remainder of the house.[343] The sash was removed in 1991 to install an electrical cable to the Workshop. The sash and frame are in good condition.

003-W1

This window is believed to have been constructed with the West Wing in the late 1830s (Figure 2.120). The first images of this window appear in a circa 1860 photograph and an 1868 engraving of the house, but there are no discernable details (Figures 2.3 and 2.4). In a 1913 photograph, a partial image of the window compares favorably with the style that now exists (Figure 2.14). Paint analysis confirms that the sash and frame have high nineteenth century historic integrity.[344] One unusual aspect of the sash is that interior surfaces have never been painted.

There is evidence of previous modifications performed on masonry surrounding the window but it is unclear if it was repointing or infill work. Portland cement mortar now finishes the interior masonry sill. The horizontal sliding sash are heavily painted at exterior surfaces and are consequently not functional. Overall, the window appears to be in good condition although paint removal may uncover concealed deterioration.

005-W1
005-W2
005-W3
006-W1

These double hung windows were constructed when the crawlspace in this area was deepened in 1940 by Delbert Wenzlick to provide a full basement apartment space.[345] Previously, HABS Room 4 was supported on wooden piers with an open crawlspace beneath (Figure 2.22). These windows have no integrity with respect to the nineteenth century. Each of them are in fair condition.

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[342] WUTA, samples P002S-481 and -482.

[343] WUTA, samples P002BN-483 and -484.

[344] WUTA, samples P003S-530 and P003W1-531.

[345] Bill Wenzlick to the author, 25 October, 1991. Wenzlick also recalled that the crawlspace beneath HABS Room 4 was very shallow.

101-W1

Physical evidence indicates that stud framing has been modified and a knee brace removed in the area of this double hung window. Fenestration symmetry at the north exterior elevation of the house suggests that no window should have existed in this location. Bill Wenzlick could not recall a window being in this location in the 1920s and 1930s.[346] However, this window can be seen in the 1940 HABS photographic documentation (Figures 2.28, 2.29, and 2.30). It is possible that this window was added sometime in the late 1930s to provide additional light into an otherwise darkly lit room, but this is unlikely as the window originated from the Long House. Filled mortises from early shutter hardware attests to the historic integrity of the exterior casing.

This window was probably installed when the Hunt Addition was constructed between 1818 and 1820. Room 101 would have had only one window since Window 101-W6 was replaced by a door when the Hunt Addition was constructed. The owner may have realized that the room was not provided with enough natural light and had this window added. The window was then installed in its present location to provide light to the back of Room 101. It is also possible that this window was put in place of a former door opening dating from the 1818 construction of the Long House. The opening is directly in line with the former door which opened into Room 101 from the front porch.

The window frame has been modified to accommodate the installation of a thicker wall constructed by the Wenzlicks in 1940. Based upon paint evidence, the existing sash and exterior casing are original, but the interior casing is not.[347] The window is in good condition.

101-W2
103-W2

The earliest graphic documentation of the house shows images of these window openings, although there is some question as to their installation date (Figures 2.1 and 2.8). These windows may have been added around 1840 in response to modifications to the front entry and porch. These windows replaced doors opening into two early first floor rooms (See Historic Building Chronology, Phase III).

Paint analysis indicates that all components of each of these windows are historic. Because the porch protected them from the weather, the windows are in fair to good condition. Addition of single pane interior storm windows by the Wenzlicks to reduce air infiltration has resulted in the removal of original interior window stops. Heavy paint has rendered the sash inoperable.

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[346] Bill Wenzlick to the author, 16 April, 1992. Room 101 served as Wenzlick's bedroom during the 1920s and 1930s.

[347] WUTA, samples P101W1-507, -508, -509, and P101N-191, -192, -193, -198.

Figure 2.121 - Interior of Window 103-W1, 1994. This is the typical appearance of most windows in the house. (Photograph by the author, ULSG collections).

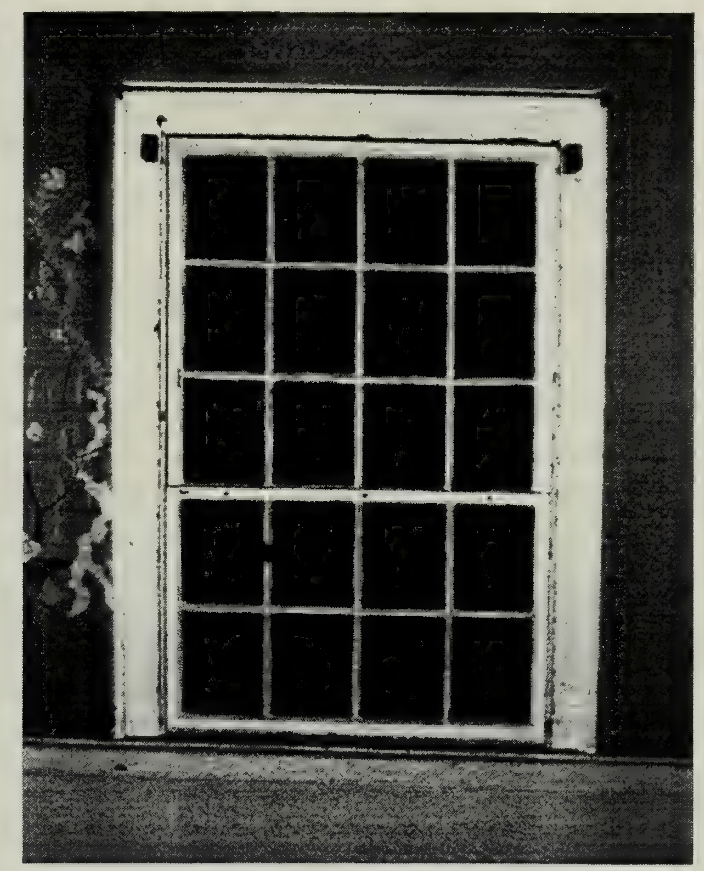
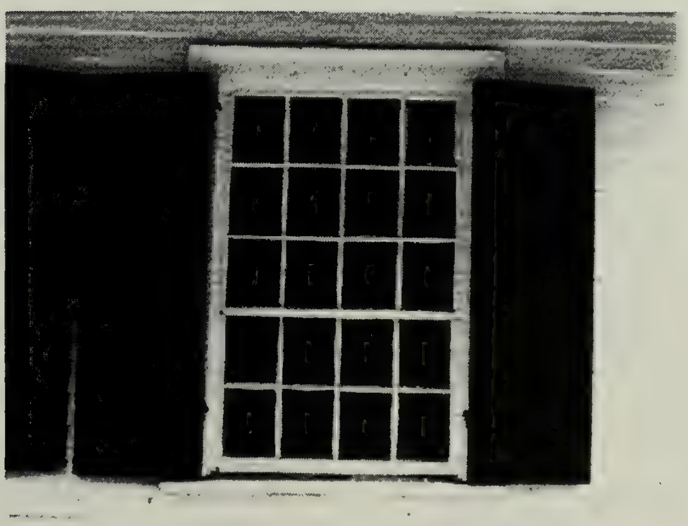


Figure 2.122 - Window 101-W3, 1994. The typical exterior appearance of house windows. (Photograph by the author, ULSG collections).



101-W3
103-W1
These windows appear in the earliest graphic documentation of the house, and there is no physical or documentary evidence to suggest that they have not been on the house since construction of the Long House (Figures 2.1 and 2.8). Paint evidence confirms that all components have high historic integrity with respect to construction of the Long House. Each of the windows is in fair to good condition, having been protected from the elements by the porch. Addition of single pane interior storm windows by the Wenzlicks to reduce air infiltration has resulted in the removal of original interior window stops on 101-W3. Original stops in Window 103-W1 were ripped lengthwise and reused when the storm glass was installed. Heavy paint has rendered the sash inoperable.

101-W4
101-W5
These two openings were added during 1940 Wenzlick renovation work and therefore have no nineteenth century integrity. The window openings are not indicated in the 1940 HABS documentation (See HABS drawings, First Floor Plan). A 1940 HABS photograph of the east elevation even shows the house being prepared for installation of these windows (Figure 2.25). Casing profiles and general details match very closely with original window millwork. But paint analysis indicates conclusively that these are reproduction windows that have not been salvaged from elsewhere on the house.

101-W6
This window was installed in 1940 to replace a door installed when the Hunt Addition was added to the Long House between 1818 and 1820. However, paint evidence indicates that the sash and frame are historic.[348] The casings are contemporary reproductions however.

When the Long House was constructed, a window existed in the present opening. When the Hunt Addition was added it is believed that the window opening was modified to accept a door. In a 1940 HABS photograph taken during demolition of the Hunt Addition (Figure 2.30), portions of the opening can be seen, particularly at the east jamb. The image shows that the original exterior window casing remained in place when the opening was converted to a door for passage to the Hunt Addition (see 1940 HABS drawings, Sheet 1, First Floor Plan). When the door was installed between 1818 and 1820, the carpenter removed the window sash and sill and cut an opening to the first floor level from the sill. The image of the lower end of the east casing shows where the casing was cut back to receive the sill. At the time this photo was taken, siding butted the east surface of the casing, but passed beneath the former location of the window sill.

During the early twentieth century, the small Hunt Addition room was converted into a bathroom.[349] Bill Wenzlick recalled that there was a door at that location, but it was never used because a toilet and lavatory were placed against the south wall of the small Hunt Addition room, and a large wardrobe concealed the door face in Room 101.[350] Whether the Wenzlicks incorporated the frame and casing remains of the early window into the existing window is unknown. The existing sash is historic but came from some other window on the house. All components are in good condition but are inoperable.

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[348] WUTA, samples P101N-201, -202, -203, -585, and P101W6-504, -505, -506.

[349] Bill Wenzlick to the author, 16 April, 1992. His grandfather Albert added the bathroom to the existing small room.

102-W1
102-W2
102-W3
These windows were probably installed along with the front door by Frederick Dent, during extensive renovation work prior to 1840. Paint evidence indicates that the sash and frames are of nineteenth century integrity.[351] When front Door 101-D1 was installed, a structural post was removed from roughly the center of the present doorway. As a result the transom window may bear some of the perimeter wall loads, as borne out by ceiling deflection at the head of the window.

Although the transom is currently fixed to the frame, the window was operable for a time. Paint ghosts of former hinges and latches can be seen and felt on the sash and frame surfaces. One curiosity about the side light sash is that the glazing faces the interior while the muntins are presented at the exterior. Whether this was done for aesthetic reasons or if the sashes were mistakenly reversed is unknown. The windows are generally in fair condition.

104-W1
104-W2
Early graphic documentation of the house show these two West Wing openings in existence during the nineteenth century (Figures 2.3, 2.4, 2.5, and 2.6). Their integrity has been compromised by the addition of Monel metal weatherstripping and interior storm windows, but paint analysis reveals that the sash, frame, and casing demonstrate a high level of historic integrity.[352] Although each of these windows have the same appearance and style as the Long House windows, their detailing and profiles differ slightly from those found on the Long House historic windows. The windows are in fair condition.

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[350] Bill Wenzlick to the author, 16 April, 1992 and 8 December, 1994.

[351] WUTA, samples P102W1S-404, -405, -406, and P102S-11, -12, -13.

[352] WUTA, Samples for 104-W1 include P104S-118, -119, -120, -121, and P104W1-429. Samples for 104-W2 include P104W-127, -128, -129, -130, P1WW-432, and P1WW-439.

106-W1
106-W2
107-W1

These windows were installed during 1940 renovation work. In comparing existing conditions with photographs from 1913 and 1938 (Figures 2.13, 2.14, and 2.22), the HABS Room 4 windows vary considerably in location and sash light configuration. The existing sash fabricated by the Wenzlicks mimic the style found on windows in the Long House and West Wing. Paint analysis indicates that the existing windows are of twentieth century construction.[353]

Although existing Window 106-W1 is in the location of a previous nineteenth century window, its size is smaller (See 1940 HABS drawings, First Floor Plan) and the lights are twelve over eight compared to six over nine as shown in Figure 2.14. In fact, the window image seen in Figure 2.14 is the tallest window documented for the house. Remnants of the former window confirm that the window was about 3 inches taller than any other historic window on the house (see Room Finish Survey, Dressing Room 106). Documentation for the window first appears in an 1875 engraving (Figure 2.7). The difference in sash light size between the upper and lower sashes in the photograph indicates that one of the historic sashes had been replaced by 1915. The existing window is in fair condition.

The size of Windows 106-W2 and 107-W1 is comparable with the images of those that appear in 1940 HABS drawings and historic photographs. However, the existing lights are 12 over 8, whereas the comparable windows in the Wenzlick photograph dating around 1938 are 6 over 6 (Figure 2.22). Paint analysis indicates that the existing windows were installed during the 1940s or 1950s. These existing windows are in fair condition.

Graphic documentation on the appearance and widths of the three historic windows along the north elevation of the 1940 HABS Rooms 4 and 5 appear in Figures 2.2, 2.39, and 2.40, and in the 1940 HABS drawings. The window image nearest the northwest corner in 1940 HABS Room 4 is very similar to windows found in the Long House and West Wing. That window may have been salvaged from elsewhere on the house during nineteenth century construction work on the house and incorporated into the room upon its construction.

The two windows in the 1940 HABS Room 5 were very similar in size and style in comparison to the existing attic Windows 301-W1 and 301-W2, but there is no evidence that the attic and Room 5 windows were fabricated at the same time.

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[353] WUTA, samples for 106-W1 include P1WW-435, -436, P106W-149, -150, and -151. Samples for 106-W2 include P106W2-443, -444, -445, P106N-142, -143, and -144. Samples for 107-W1 include P107W1-446, -447, -448, P107N-152, -153, and -154.

108-W1
108-W2
109-W1
109-W2
These windows were installed by the Wenzlicks with the construction of the kitchen addition, or HABS Room 4, around 1950. These homemade windows emulate the double hung style and feature muntins fixed between two glass panes. There is no indication that any portion of these windows date to the nineteenth century.

Breezeway Windows
All windows in the breezeway were installed with construction of the breezeway around 1950. There is no physical evidence to indicate that they have any nineteenth century integrity.

201-W2
206-W1
Although these windows are not indicated in pre-1940 photographs, nor documented in the 1940 HABS drawings (See HABS drawings, Sheet 1), some of the millwork was salvaged from elsewhere on the house by the Wenzlicks during their renovation work. Only the sash have nineteenth century integrity in Window 201-W2. The sashes were salvaged from the north window in the 1940 HABS drawings of Room 4 during 1940 renovation work. The sash have a coat of turquoise paint, a color unique to the old kitchen (see Room Finish Survey, Dressing Room 106).

Only the exterior casing and frame of Window 206-W1 were found to possess nineteenth century historic integrity. These window pieces may have been salvaged from either the Hunt Addition when it was demolished in 1940 or from the window which was at the opening now occupied by kitchen Door 103-D4.

201-W1
203-W1
These window openings appear in the earliest illustrations of the house (Figure 2.1), and there is no reason to believe that they do not date to original construction of the second floor. The image of these windows in that illustration is very vague; it appears that the shutters are closed or the artist was attempting to merely highlight the windows by darkening them. The 1940 HABS drawings indicate that these windows were casement rather than double hung style (See HABS drawings, Sheet 1, Second Floor Plan). Unfortunately, there is no clear photographic evidence to confirm the nineteenth century style of these windows, as the south elevation at the second floor is always cast in dark shade. Hinge mortise pockets for the casements have all been filled with putty. Existing physical evidence also indicates that the window frames were detailed to accept double hung sash.

The history of these windows can only be developed based upon scant graphic documentation, remaining physical evidence, and a comparison with the known history of other second floor windows. Window 203-W3 is documented to have had a set of casement style sashes for a very short period during Albert Wenzlick occupation (see 203-W3 analysis). The casement style windows indicated in the 1940 HABS drawings were installed during Albert Wenzlick's occupation, and were originally constructed to receive double hung sash.

While the existing sash are in the style of the original windows, they have no nineteenth century integrity. Paint analysis confirms that the exterior and interior casings and frames of each of the windows are historic, but the sash are of recent make.[354] Their condition is generally good, owing to the shelter provided by the porch roof.

202-W1

The earliest graphic documentation for this central hall window shows in a 1913 photograph (Figure 2.13). At that time the window style was double hung, although the distribution of lights is difficult to ascertain. By the time Albert Wenzlick completed his renovations of the house, this window was modified to receive an interior swinging casement window (Figure 2.22). Hinge mortise pockets from the casement windows still remain in the exterior casing. The 1940 HABS drawings confirm the existence of the casement style window at that time (See 1940 HABS Drawings, Sheet 1, Second Floor Plan). By the time Delbert Wenzlick completed his renovation work, this window reverted back to a double hung window that remains today.

Although the sash are Wenzlick reproductions, paint analysis indicates that the frame and all casings are historic to the construction of the Long House.[355] The existing window is in fair condition, although the sill is severely out of square with respect to the jambs. This condition cannot be seen in any of the 1940 Wenzlick or HABS photographs indicating that structural movement may have occurred in the wall framing system since that time.

203-W2
203-W4

These windows are not indicated in pre-1940 photographs nor are they documented in the 1940 HABS drawings (See HABS drawings, Sheet 1). These windows were added by Delbert Wenzlick during 1940 renovation work, presumably to allow entry of more light into the interior spaces. These windows have no nineteenth century integrity; they are in good condition.

203-W3

A 1940 HABS photograph (Figure 2.26) and a circa 1940 Wenzlick photograph (Figure 2.39) clearly show this window as casement style sash while all other photographs previous to and after 1940 show this window as double hung style sash. The 1940 HABS drawings also verify that this window had casement sash at that time (See HABS drawings, Sheet 1, Second Floor Plan). Clearly, the original double hung window was removed and replaced during Albert Wenzlick's occupation. Then the casement was removed and replaced with a double hung window during Delbert Wenzlick 1940 renovation work. Physical evidence of hinge mortise pockets for the casements are still visible on the exterior casing. Therefore, the existing sash has no nineteenth century fabric integrity but the frame and all casings date to construction of the Long House. Paint analysis verifies the authenticity of the casings and frame.[356] The existing double hung window is in fair condition but inoperable due to heavy applications of paint.

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[354] WUTA, samples for 203-W1; P203W1-364, -365, and -366, and P203S-250. Samples for 201-W1; P201W1S-381, -382, and -383, and P201S-213 and -577.

[355] WUTA, samples P202N-287, -288, -289, and -578. Paint analysis of exterior casing sample P201W1S-381 was inconclusive. But examination of in-situ paint layers indicated that the exterior casings are historic to the construction of the Long House.

207-W1

This window cannot be seen in any photographs until 1938 (Figure 2.23), and is clearly shown in 1940 HABS and Wenzlick photographs (Figures 2.30 and 2.38). The lower half of the window was concealed within the Hunt Addition attic space until the Wenzlicks demolished that addition in 1940. Prior to demolition work, half of the window opening was concealed or framed-in by interior finish materials. The twelve-light upper sash was removed and the eight-light lower sash was moved to the upper sash position.[357] The 1940 HABS drawings documented a hinged hatch or door in the window opening, but the drawings are not specific as to the material or location with respect to the rest of the window (See 1940 HABS Drawings, Sheet 1, Second Floor Plan). The hatch could have covered the lower sash or the entire window opening and may have served as access into the Hunt Addition attic. The present twelve over eight double hung sash was installed by the Wenzlicks during 1940 renovation work.

The sill of this window dictated the placement of the early Hunt Addition roof line. The designer of the Hunt Addition wanted to retain use of the second story window yet use as much of wall height to the underside of the sill (Figure 2.38). When the second Hunt Addition roof was constructed, presumably to provide greater watershed, the window opening became a hinderance to the gabled roof. The builder of that roof had to provide some creative framing to work the roof into the meeting rail of the sash.

Paint evidence indicates that the frame and all casings of this window possess high historic integrity with respect to the original construction of the Long House.[358] However, the integrity of the sash are in doubt. Each of the sash have a green layer but the hue is much lighter than found on other historic windows. Although there is no documentation of this window prior to 1938, the original sashes presumably matched windows on the remainder of the Long House.

This window possesses a portion of the only remaining shutter hinge hardware installed during the early nineteenth century (see Exterior Shutters). The existing window frame and casing are in fair condition. The sash are in poor condition having been affected by high humidity levels in the bathroom.

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356. WUTA, samples P203W3-471, -472, and -473, and P203N-232 and -580.

357. Bill Wenzlick to the author, 16 April, 1992. Wenzlick could not see out that window when he was a boy as the lower sash had been covered but the upper sash was left in place.

358. WUTA, samples P207N-281, -282, and -283. Results of exterior casing sample P207W1-451 are inconclusive. However the dark green color marker was found on all casing pieces during an in situ examination.

301-W1
301-W2
Images of these six-over-six gable-end attic window openings appear in nearly all nineteenth century graphic documentation (Figures 2.1, 2.3, 2.5, and 2.7). Perhaps the clearest image of the west window (301-W1) occurs in the earliest known photograph of the site. In Figure 2.3 the window looks very much as it appears today except two panes in the lower sash seem to have been missing, or the other panes had been painted over.

Physical evidence suggests that each of these windows were installed sometime after construction of the Long House. Gable end studs appear to have been cut and the windows installed without the benefit of lintels. There is also a fair amount of blocking between the window frame and studs. If the windows were added, the work took place within twenty years of construction of the Long House.

While the frames and exterior casing are similar in construction between these two windows, the sash profiles are not. Window 301-W1 muntins have a narrow "bullet" shaped profile while the 301-W2 sash muntins have an ogee profile. The frames are detailed to receive a double hung style window, so there is no reason to believe that the sash have been anything other than double hung. Paint evidence suggests that all components have high historic integrity. The windows are in fair to poor condition; the sash joints are loose and the fabric somewhat deteriorated.

301-W3
301-W4
These casement style windows were installed when the dormers were constructed during Albert Wenzlick's ownership (see Roof Systems). The casements match the style of windows Albert Wenzlick used to replace most of the second floor double hung windows. These windows are in fair condition.

Exterior Shutters

The earliest illustrations and photographs indicate that the house bore shutters (Figures 2.1 and 2.8). However, the limited views of the house up until 1913 make documentary determination of the specific windows that bore shutters during the nineteenth century difficult. For instance, nearly all early drawings indicate that shutters existed at the south elevation of the second floor, yet in a photograph taken in 1890 those same windows had no shutters (Figure 2.11). By the time the Wenzlicks purchased the property, shutters can be seen hanging from several windows on photographs taken in 1913. But most of the shutters were in very poor condition, particularly at the north elevation (Figures 2.13 and 2.15). Albert Wenzlick may have favored removal of deteriorated shutters rather than repairing or replacing them during his renovation work. Bill Wenzlick could not recall any shutters in place during his stay at the house prior to 1940.[359] This recollection is

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[359] Bill Wenzlick to the author, 16 April, 1992.

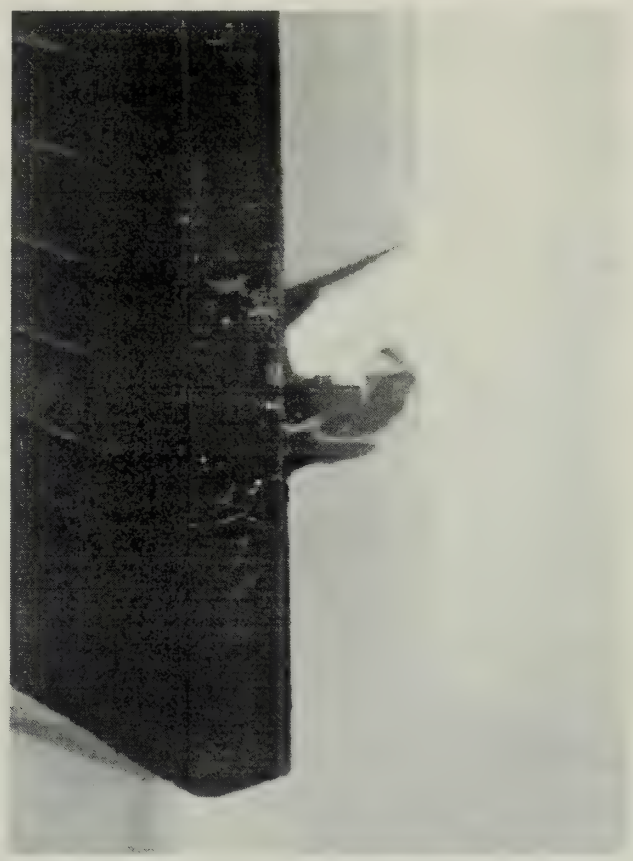

Figure 2.123 - Typical Main House shutter hinge, 1994. The present cast iron hinges may have been salvaged from other structures. Most of the existing hinges are broken. (Photograph by the author, ULSG collections).

consistent with photographs taken during the 1910s, as there were no shutters on the house at that time (Figures 2.17 and 2.18). However, by the 1920s shutters were in place at the south elevation ground floor (Figures 2.20 and 2.21). Albert Wenzlick may have replaced the original shutters or stored them somewhere on site for later installation.

To further complicate shutter documentation, around 1940 Delbert Wenzlick salvaged shutters from other nineteenth century structures in the St. Louis area, with the intent of installing those that would fit on the windows that had no shutters.[360] Delbert either salvaged or purchased new shutter hardware that exists on the house today.[361]

At present, twelve shutters bear a sixteen over fifteen slat configuration, and six shutters have eighteen over eighteen slats. These existing shutters may have any historic integrity with regard to the Main House. Seven of the sixteen over fifteen shutters have Roman numerals stamped into their styles; the last numeral ending with "VIII." However, these shutters also have Roman numbers stamped into their top rails as well. This signals that these shutters may have been salvaged from some other structure or structures and redesignated by the Wenzlicks.

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[360] Bill Wenzlick to the author, 16 April, 1992. Delbert Wenzlick salvaged shutters from any place he could find them. Bill Wenzlick recalled that the Mill Creek neighborhood, located just west and south of Union Station in St. Louis, was one of Delbert's salvage spots. The city demolished hundreds of nineteenth century brick homes in that area with the intent of land redevelopment.

[361] Bill Wenzlick to the author, 16 April, 1992. According to Bill Wenzlick, Delbert Wenzlick tried to match salvaged hardware with any existing on the house at that time. However, the scant remains of the original hardware do not compare favorably with the existing. Bill Wenzlick also said that a box of shutter hardware was left in the workshop when St. Louis County took possession of the house. The box of hardware has not been located.

The existing shutters are in fair to poor condition. All shutters are screwed to siding and window casings, rendering them inoperable. Most of the shutters do not fit the window openings; salvaged shutters are heavily painted. The shutters at the second floor north elevation are inexpensive reproductions, installed purely for aesthetics.[362] There is a variety of cast iron shutter hardware; most in poor condition (Figure 2.123).

In all probability, none of the existing shutters and most of the hardware have historic integrity with regard to this house. Therefore, discussion of the shutters will be limited to the windows that contained shutters during the nineteenth century based upon graphic documentation and existing physical evidence, followed by a more specific tabulation of each set of shutters. The following analysis will be limited to historic window placements for specific portions of the house; windows installed during Wenzlick occupation will not be addressed.

Long House Shutters

The clearest and earliest photographic documentation for shutters occurs in an 1883 photograph at the front porch (Figure 2.8). If the shutters which appear in that image were original to the building, they would have been almost 70 years old by then. However, it is the best information that is available at the time of this writing. In that photo, shutters at Windows 101-W2, 103-W1, and 103-W2 are divided into two sets of adjustable louvered blinds. There are sixteen slats at the top set and fifteen slats at the bottom set. This configuration is also confirmed for Windows 101-W2 and 101-W3 in an 1890 photograph (Figure 2.11), and in West Wing Windows 104-W1 and 104-W2 of the 1913 Wenzlick photographs (Figure 2.14). In a 1940 HABS photograph, the right shutter of Window 101-W3 was replaced because eighteen slats are counted at the lower set and about the same at the upper set. However, the left shutter remained the traditional sixteen over fifteen slats (Figure 2.24). All other shutters in that photo are too blurred for accurate analysis.

Shutters for the second floor windows at the south (front) elevation are documented in the earliest illustration of the house (Figure 2.1), but there is no photographic evidence until after 1940 renovation work. However, in a photograph taken around 1890 no shutters existed at second floor Window 201-W1 (Figure 2.11). Close examination of the lower left hand corner of the window image suggests that hinge pins were in place at that time. The existing shutter hinges on Windows 201-W1 and 203-W1 have only coats of white paint, demonstrating that the Wenzlicks may have installed the shutters at the second floor porch level or at least replaced the hardware.

Shutters were present on two historic windows at north elevation second floor Windows 202-W1 and 203-W3, at least until Wenzlick ownership in 1913. In Figure 2.13 the shutters for both windows were badly in need of repair; each had only their right shutter, and one is seen lying on the rear porch

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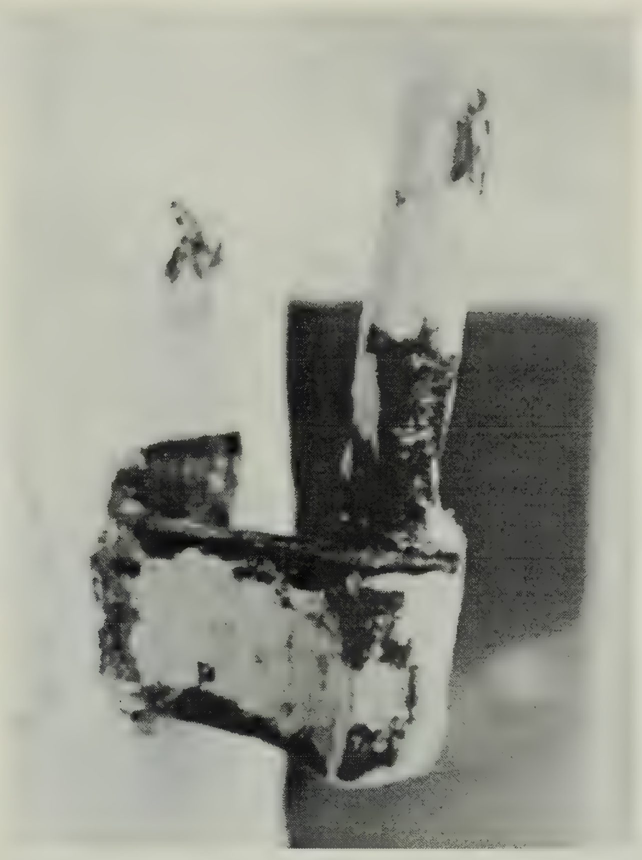
[362] Grant L. Mugge to the author, 10 January, 1995. St. Louis County Park and Recreation Department installed these second floor shutters during the late 1980s.

Figure 2.124 - Shutter hinge pintle at Window 207-W1, 1993. This hand wrought iron pintle is all that remains of the shutter system installed on the Long House in the early nineteenth century. The pintle is held in place by a mortise pocket chiseled into the window casing. (Photograph by the author, ULSG collections).



roof. The quantity of blinds on the remaining shutter of 203-W3 cannot be counted, as the image is poor and obscured by tree limbs. The existing shutters of these two windows (and on all of the north elevation second floor windows) are inoperable twentieth century replacements, but it is believed that the frame mounted halves of two hinges on 202-W1 are original. The remainder of the hinges have been removed, but their mortise pockets remain. There is no physical nor documentary information that the attic gable end windows had shutters.

Window 207-W1 had shutters after initial construction of the Long House. These were apparently removed upon construction of the second Hunt Addition gabled roof, which concealed the lower sash and made shutter installation nearly impossible. Shutters were not installed on this window again until after 1940 renovation work.

Evidence of an old shutter hinge system on the Long House windows is the most reliable indicator that the Long House windows had shutters. The pintle half of a hand wrought shutter hinge remains on Window 207-W1 (Figure 2.124). This is apparently the only piece of shutter hardware remaining from the initial construction of the Long House. The hinge base is constructed from strap iron set into a casing mortise. How the base of this particular hinge is held in place is unknown.[363] More importantly, the presence of window casing mortises on any other window signifies that the window

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[363] Jesse Francis to the author, 24 September, 1993. From experience with historic structures in the St. Louis region, Francis indicated that barbs were usually cut into the strap base to prevent the hinge from being pulled out of the mortise.

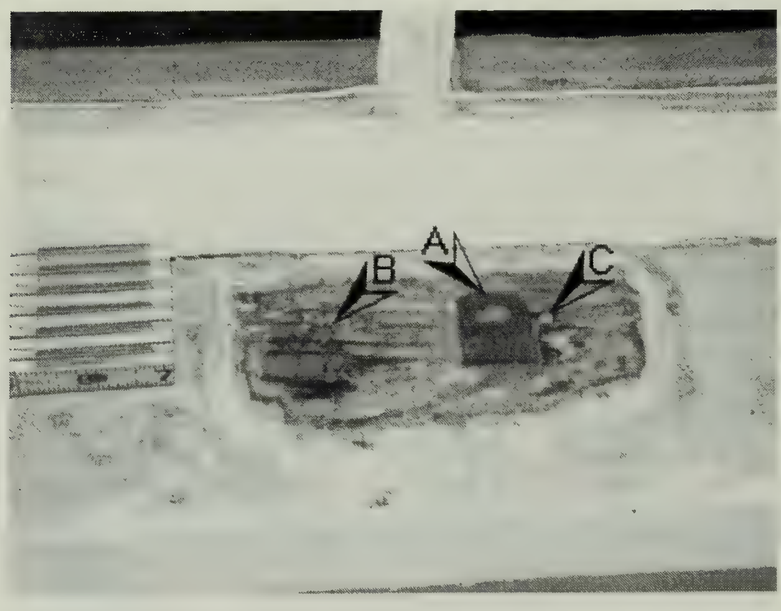

Figure 2.125 - Window sill shutter catch hardware, 1994. Two episodes of sill catches were found on Window 201-W1 beneath heavy paint coats. A stamped steel keeper plate (**A**) is believed to be of mid-twentieth century make. A pair of screw holes at **B** and **C** is physical evidence that each shutter once had individual sill catches. Holes were also found on the sill of Window 101-W3. (Photograph by the author, ULSG collections).

dates to construction of the Long House. The mortise hinges remained on the Long House windows until about 1940 when Delbert Wenzlick had them removed and replaced with cast iron, self-locking type hinges (Figure 2.123). Close examination of 1940 HABS photographs confirm that the mortise hinges remained in place until then (Figures 2.26 and 2.29). The disposition of the removed mortise hinges is unknown.

Other shutter hardware can be seen in historic photographs. Dark spots on the lower corners of shutter images seen in Figures 2.8 and 2.11 indicate that catches were present during the nineteenth century. The catches latched into a sill-mounted keeper to retain the shutters in the closed position. Many of the existing shutters, particularly at the south elevation ground floor, have catch hardware fastened to the shutters. However, all of the existing hardware was replaced after 1940, or the catches were already fastened to the salvaged shutters. Screw holes beneath thick coats of sill paint indicate the former existence of keepers (Figure 2.125).[364] Sill catches may have been too small to be detected in the images if they were ever in existence.

A paint sample from the remaining mortise hinge was analyzed in an attempt to determine the paint colors of missing historic shutters. The detectable layers include; black, dark brown, light gray, gray, light green, black, and light gray, followed by twenty-six layers of white.[365] The first black layer was probably applied directly to the hinge. The dark brown color is very similar to early layers found on the front Door 102-D1 and second floor porch Door 202-D1. The shutters may have been painted brown to complement the doors and cream colored siding. Since the Window 207-W1

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[364] Screw holes and keeper impressions were found a Windows 101-W3 and 201-W1. A twentieth century pressed and plated keeper was also found on 201-W1.

[365] Arbogast, *Paint Analysis*, sample PN-597.

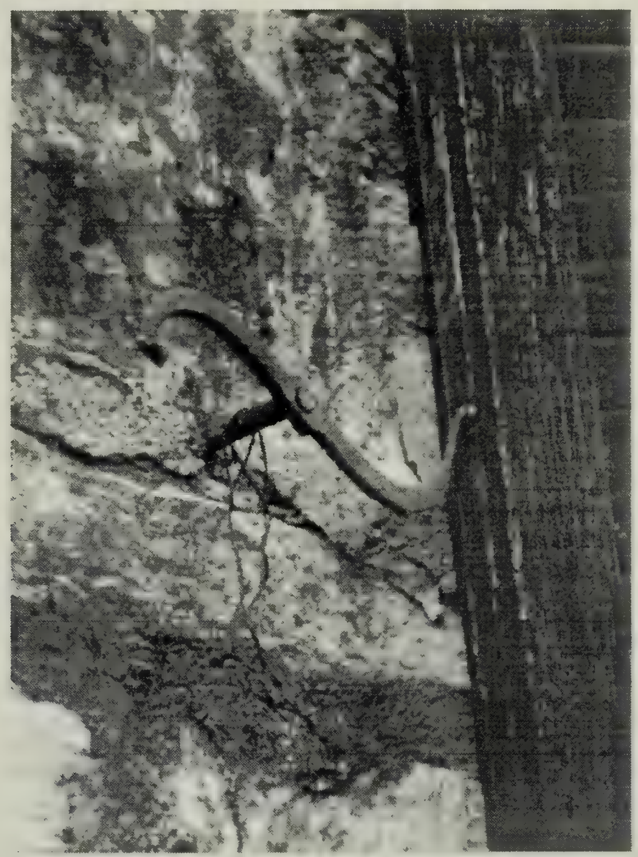

Figure 2.126 - Shutter dog at West Wing Window 104-W2, 1994. It is unknown when this hand made hardware piece was installed. (Photograph by the author, ULSG collections).

shutters were removed during late 1830s construction of the second Hunt Addition roof, remaining layers probably reflect overpainting of surrounding siding and trim colors of grey and light green.

West Wing Shutters

No shutters can be seen on the West Wing in an 1860 photograph of the house (Figure 2.3). Shutters were added to the West Wing between 1860 when Figure 2.3 was taken, and 1890 when Figure 2.11 was taken. West Wing Window 104-W2 shutters are now eighteen over eighteen slats, differing from the sixteen over fifteen slat type seen in the 1915 Wenzlick photograph (Figure 2.16). Each of the shutters for this window bears stylized initials "HD," which may have been carved by one of the Davis family members.

There is no physical evidence that the two West Wing windows had hand wrought and mortised shutter hinges. The shutters presumably had cast iron self-locking hinges that were popular during the mid-to-late nineteenth century. It is possible that the hinges installed during the nineteenth century remain on these two windows. Although some of the existing shutters bear sill catches, there are no keepers. Screw holes in the sill of 104-W2 give evidence that keepers were installed at one time.

A hand wrought shutter dog is anchored to the west chimney stack to retain the north shutter of Window 104-W2. When the shutter dog was installed is unknown. Its reach is just long enough to check the swing of the existing shutter. The shutter dog appears in a 1940 HABS photograph, but all other photographic images in this area of the house are too blurry to be conclusive.

Hunt Addition Shutters

The only evidence for the existence of a shutter on the Hunt Addition is apparent on a Wenzlick photograph taken in 1913 (Figure 2.13). In that photo, the lower set of slats numbers to fifteen while the upper set is completely blurred, at least partially confirming that this set of shutters matched the type of those shown in the earliest photographs of the house. A 1940 photograph (Figure 2.37) clearly shows cast iron, self-locking style hinges in place but the shutters are missing. The absence of photographic evidence of hand wrought pintles indicates that this pair of shutters may have been installed in the late nineteenth century, concurrent with the West Wing shutters.

HABS Room 4 and East Wing

There is no documentation that the HABS Room 4 windows ever received shutters. Close examination of Wenzlick and 1940 HABS photographs reveals no hardware present during the first half of the twentieth century. Considering that hardware remained on practically all other windows where shutters had been removed, it is assumed that shutter hardware would have been treated similarly to the HABS Room 4 windows. Physical evidence is non-existent, because original windows were demolished during 1940 renovation work.

Cast iron, self-holding shutter hinges are the only type now found on the house, except for the single hinge pintle found on second floor Window 207-W1. Although the images are hazy, an 1883 photograph shows a set of hinges of similar in character to what is now on the house (Figure 2.8). These type of hinges require a catch on each shutter and a mount on the sill to hold the shutter in place while closed.[366]

In summary, shutters were initially placed on the first and second floor windows of the Long House around 1818. These shutters had hand wrought hinges and may have been painted dark brown for a time. The brown finish probably remained on the shutters until the house was painted grey sometime during the 1860s. After dark brown, the chromochronology is unknown because none of the historic shutters remain. The style and appearance of the original Long House shutters and hinges is unknown. Between 1860 and 1890 the Long House shutters and associated hardware were replaced with shutters bearing a sixteen over fifteen slat configuration. The hardware was replaced with self-locking cast iron hinges and sill catches, although the original hand wrought hinge pintles may have remained in place. Shutters were probably added to the West Wing and Hunt Addition at the time the second generation of shutters were added to the Long House. The second set of shutters was in extremely poor condition when Albert Wenzlick purchased the property in 1913. Albert removed the shutters but installed either the repaired or new shutters about twenty years later. In 1940 Delbert Wenzlick replaced some or most of the shutters and hardware with shutters he salvaged from other St. Louis buildings.

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[366] *Builders' Hardware* (Scranton, Pennsylvania: International Textbook Co., 1908), p. 38. This type was also known as the Lull and Porter hinge, and was manufactured in several sizes.

Room Finish Survey

Room finish treatments historically reflect the effects of aging and use, and changes in room function. The Main House contains a variety of finish systems including split wood lath, vertical and circular sawn wood lath, metal lath, and gypsum lath in addition to some gypsum wall board and wood finishes installed since 1940 renovation work.[367] Fortunately, an analysis of the existing gypsum and plaster finishes completed prior to physical investigation work found no asbestos bearing materials.[368]

The goal of a physical investigation conducted in 1992 was to ascertain the historic integrity and condition of wall and ceiling finish systems for each room. Small holes were bored into surfaces which had no electrical devices, such as outlet and switch boxes, which could be removed to reveal the finish system. In addition, a detailed analysis was made of selective plaster samples (see Appendix C - Mortar and Plaster Analysis). The following analysis will describe the finish system or systems and their approximate date or dates of installation for each room. The historic integrity of wall and ceiling finishes is important in final treatment in terms of their preservation or degree of sacrifice for the installation of new mechanical and electrical systems.

In general, the finish survey determined that approximately 40-percent of the original wood lath remains intact in the historic portions of the house. All of the plaster has been replaced during the twentieth century. Lime and sand plaster only occurs in the second floor Stair Hall 202 east and west wall finishes. The remainder of base coat finishes are composed of a gypsum and sand mix probably

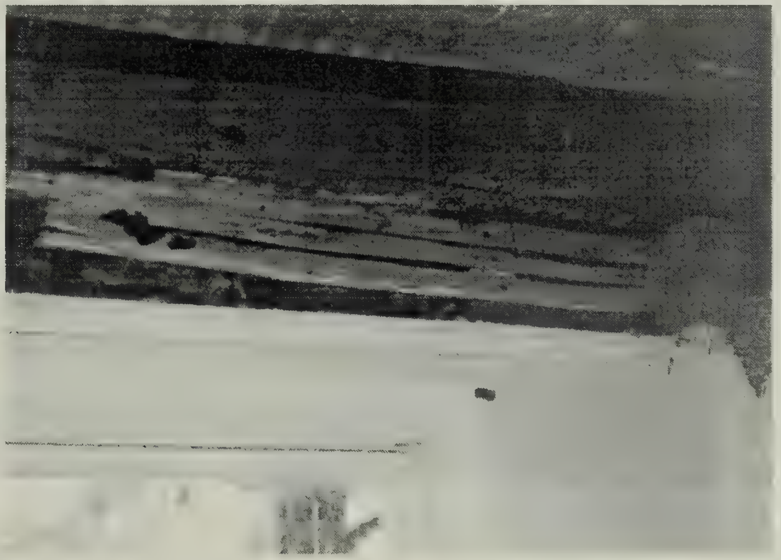

Figure 2.127 - Hand split lath in Room 101, 1994. This small section of oak lath was installed with the construction of the Long House. The lath was uncovered during a 1992 physical investigation of the Room 101 ceiling. (Photograph by the author, ULSG collections).

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[367] 367. Bill Wenzlick to the author, 24 February, 1992. The 1940 plaster finishes were installed by a man nicknamed "Old Shorty" who was quoted by Wenzlick as saying he "took most pains to do the dining and bathroom walls as this is where people sits and looks around the most."

[368] 368. ATC, 1.

installed during Wenzlick occupation.[369] A section of brown coat plaster at the west wall of the Dining Room 103 contains a high percentage of portland cement, yet is placed directly over split lath.

In West Wing Room 104, evidence of a former plaster system fills the bottom 2 feet of the cavities formed between the vertical logs. The old soft plaster keys are quite different in composition when compared to the existing plasters in this room. Samples taken of historic plaster remaining in Living Room 101 and from the debris are virtually identical to the Stair Hall 202 plaster mix, one part lime to two parts sand.[370] The former plaster system keys broke off at the back side of the wood lath when the finishes were removed in preparation for the application of the new plaster over retained lath. The wall cavities were never cleaned of the old plaster keys.

In terms of system types and construction chronology, hand split white oak[371] lath was initially installed in the Long House (Figure 2.127), and sawn white pine[372] lath over surfaces in the West Wing and HABS Room 4. At the first floor all original wood lath remain intact except at nearly all surfaces in Living Room 101, the ceiling of Hall 102, a portion of the east wall of Dining Room 103, all of Hall 104-A, and about three quarters of finishes in Rooms 106 and 107. Sawn lath and plaster walls of Hall 102 may have replaced original split lath when the east wall of that room was added. At the second floor the only remaining historic lath includes the Stairhall 202 walls and the entire second floor ceiling. All other finishes have been replaced with metal lath and plaster systems.

Employment of a particular lathing system was dependent upon local availability and economy of a particular system, and plasterer preference. Therefore, the precise date for the use of lath types is difficult to determine; only a range of use can be given. In the case of this house, finish installation dates must be balanced against known historical accounts of renovation or construction work. Split, or hand-rived, wood lath was in use prior to the availability of machine sawn lath.[373] Split lath was preferred by plasterers until the introduction of less expensive sawn lath because it was a much stronger system. But construction industry economics prevailed and sawn lath almost totally succeeded split lath by around 1860.[374] In the St. Louis area, sawn lath may have been introduced as early as 1820 but almost certainly superseded split lath by around 1850.[375] Circular sawn wood lath may have been introduced as early as the 1820s,[376] but it is conceded that this saw blade use was not common in the United States until the 1830s.[377] Expanded wire lath and rock lath, or "plaster board," were in use in the United States by 1900. These two lath systems almost totally replaced wood lath by around 1940.[378]

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[369] Episodes of Wenzlick plaster use can be further subdivided through analysis of binder materials. Gypsum plasters installed around 1940 in the Living Room 101 and north wall of Kitchen 109 contained organic fiber. Other gypsum plasters contained dark animal hair and, therefore, may have been installed earlier than 1940, probably by Albert Wenzlick.

[370] Arbogast, *Mortar Analysis*, 8-9.

[371] Alden, samples L-002AW-01, L-101C-02, L-101W-03, and L-207C-07.

[372] Alden, samples L104E-04, L-106C-05, and L-106C-06.

[373] Marylee MacDonald, "Repairing Historic Flat Plaster - Walls and Ceilings," *Preservation Brief 21*, (October 1989): 4 (hereafter cited as MacDonald, *Plaster*).

[374] H. V. Von Holst, et al., *Cyclopedia of Architecture, Carpentry, and Building* (Chicago: American Technical Society, 1916), Vol. IX, 377.

Gypsum base coat plasters presently found in the house more than likely replaced the original sand/lime plasters during Wenzlick family occupation. Base coat sand/lime plasters were in common use into the twentieth century and were replaced by commercially available premixed gypsum based plasters beginning around 1900. There is little evidence in early twentieth century technical manuals published in the United States that base coats principally contained anything but sand and lime prior to 1900. Until that time gypsum was usually reserved for finish coat plaster available as a commercially mixed product patented in 1836.[379]

New floors overlaying original floors were installed throughout the house by the Wenzlicks during the 1940 remodeling episode to provide more level and even surface. As a result, floor levels rose by about 3 inches throughout the house, and by as much as 8 inches at the deflected floor in Room 201. Delbert Wenzlick attempted to match the new flooring to the historic floor material with uniformly wide tongue and groove boards, and follow the lay of the underlying floor boards.[380] Raising the floors consequently had an effect on several aspects of other room finishes including:

- The historic scale of each of the rooms changed slightly because the floors had been raised.
- All baseboards were removed and reinstalled at the new floor level. As a consequence the plaster finishes installed by the Wenzlicks reach only to the top of the present baseboards. If the baseboards are relocated to their historic location when the top floors are removed, there will be a gap between the top of the relocated baseboards and the plaster finishes.

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375. From the author's experience with historic structures at Lincoln Home National Historic Site, Springfield, Illinois, hand-rived or split lath was superseded by sawn lath by around 1850. It is possible that sawn lath was in earlier use in the St. Louis region given that city's greater population density and its development as a center of commerce when compared to Springfield 100 miles to the north.

376. John O. Curtis, "The Introduction of the Circular Saw in the Early 19th Century," *APT Bulletin*, Vol. V, No. ii, (1973): 162. Curtis references an article which indicates that circular saws of that time were principally used for "small stuff" such as staves, shingles, and clapboards but the list could almost certainly be expanded to include wood lath.

377. Fernow in Depew, *American Lumber*, 202.

378. MacDonald, Plaster, 5.

379. McKee, *Masonry*, 83.

380. Bill Wenzlick to the author, 5 September, 1990.

- Doors and their casings had been modified to accommodate the new floor level. The bottom rail of each of the doors had been sawed off so that they would fit the new opening size. Door casings and jambs were cut off at the new floor level as well.

- Fireplace hearths were raised to accommodate the new levels but chimney piece legs were sawed off and plinths removed as the hearths were built to the new levels.

- The raised floors have affected the height of stair risers at the first and second floor levels. The new floor also partially conceals the base of the second floor railing.

According to Bill Wenzlick, the original floor surface condition is similar to that of the present attic floor.[381] The attic floor is constructed of tongue and groove yellow pine[382] in widths varying between 4½ inches to 7 inches, and thicknesses varying between 1 inch and 1¼ inches. Floor surfaces which can be seen beneath the top floor of the first and second floors of the two story portion of the house confirm a similar material. The second and attic floors are surface nailed. The attic floor surface is in relatively good condition considering its age and intensity of use. There is relatively little deterioration and wear due to the hardness of the floor material. The historic floor surfaces in Rooms 101, 104, 201, 203, 206, and 207 are painted a dark green. It is suspected that the remainder of the floors concealed in Rooms 102, 103, and 202 are also painted the same dark green.

The origin of yellow pine used in the original floors and other millwork throughout the house indicates that sawn lumber commerce existed between St. Louis and southern Missouri and Arkansas during the early 1800s.[383] Although the genus of the yellow pine cannot be determined, it is believed to be short leaf pine (pinus echinata), a specie which ranged into southern Missouri.[384]

Tool marks on the Long House flooring indicate that the boards were cut with a mechanical vertical or sash saw,[385] and tongue and groove edges finished with hand planes. The finished surfaces of exposed original floors have been scoured down by traffic so no definite tool marks could be found. However, the end of one attic floor board against the west wall has what appears to be a hand plane mark near the edge.

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[381] Bill Wenzlick to the author, 5 September, 1990.

[382] Alden, sample W-301F-38.

[383] Carl J. Ekberg, *Colonial Ste. Genevieve, An Adventure on the Mississippi Frontier* (Gerald, Missouri: The Patrice Press, 1985), 143, and James Elliott Defebaugh, *History of The Lumber Industry of America* (Chicago: The American Lumberman, 1906), 276. According to Ekberg, a water powered mill providing "planks" was established in Ste. Genevieve as early as 1766. Defebaugh states that nine sawmills were reported to be in operation in the Territory of Louisiana (the portion of the Louisiana Territory above the northern border of the State of Louisiana) according to the 1810 census.

[384] J.B. Johnson, *The Materials of Construction* (New York: John Wiley & Sons, 1904), Plate VI.

[385] Saw blade bite marks average between $^3/_{16}$ inch and ¼ inch but are irregular and closely spaced at knot holes. This seems to indicate that a low power reciprocating saw may have been used.

The original builder had to compensate for the variable thickness in the raw floor material. To do this, the sides of the boards were scribed and the bottom corners planed to the desired thickness. Then the bottom surfaces in contact with the uniformly sized floor joists were tooled with a chisel or adz to attain a flush finished floor surface.[386] This technique also compensated for variations in the lay of the floor structure, particularly at the hand hewn first floor joists.

Existing crown moulding was added throughout the house in 1940. This moulding does not have enough paint coats to verify long term existence. Also, the crown moulding follows the ceiling line of bookcases and cabinets constructed by the Wenzlicks. Paint marks of crown moulding could not be found at the top of the Living Room 101 corner post casings exposed to view when 1940 ceiling plasters were removed in 1992.

With regard to millwork such as baseboards and chair rails, the Wenzlicks had the ability to fabricate new profiles to match very closely to the existing.[387] In spaces where the moulding integrity was not readily apparent, paint and wood analysis was used to identify the relative age of individual pieces. In general, original Long House interior case work was found to be of yellow pine, and Wenzlick work of Douglas fir[388]. All extant cabinets and bookcases in the house at the time the property was acquired by the National Park Service were constructed and installed by the Wenzlicks after 1940.[389] Therefore, none of the existing cabinets have nineteenth century integrity.

The following will discuss the known historic room function, material, and material integrity for existing finishes on a room to room basis. Descriptive designations heading each room analysis denote contemporary, rather than nineteenth century function. The intent of this analysis is to provide an understanding of overall finish historic integrity and condition of each space as base information to assist in the development of treatment recommendations. Paint chronologies are discussed for each habitable historic room and millwork types within each room at Appendix D. Paint chronologies were distilled from an extensive paint analysis prepared for nearly each piece of millwork in the house. Since so little is known about when colors were applied, no attempt has been made to apply dates to individual layers, except in one or two cases.

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[386] Lee H. Nelson, "Notes on Historic Flooring-An 18th Century Method for Making High Quality Wooden Flooring from Boards of Irregular Thickness," *CRM*, Volume 13: No. 4, 1990: 27-28.

[387] Bill Wenzlick to the author, 7 April, 1992. Wenzlick still has the moulding cutting blades used by his father to produce reproduction millwork for the house.

[388] Alden, sample W-SALV-67.

[389] Bill Wenzlick to the author, 24 February, 1992. The Dining Room 103 cabinet was constructed in 1940. Also, the 1940 HABS drawings show only one cabinet in Room 1 (Bedroom 104) and none elsewhere. That cabinet may have been constructed by Wenzlick's grandmother who happened to be very handy with tools according to Wenzlick.

Basement Room 001

This area was a crawlspace until it was deepened by the Wenzlicks during the 1940s or early 1950s.[390] Delbert Wenzlick constructed an expansive model train set in this space so the room is often referred to as the "train room." In general, none of the room finishes have historic integrity except perhaps for some of the tongue and groove boards used to fur the gypsum wall board ceiling and walls. The boards appear to have been salvaged from a porch deck.

When acquired by the National Park Service this room was finished in half inch gypsum wallboard over salvaged furring installed by the Wenzlicks. The wall and ceiling finishes were removed from this space in January 1992 to ascertain underlying structural condition. The furring was principally tongue and groove floor or roof sheathing boards salvaged from previous additions to the house or other structures. The furring strips were fastened directly to the first floor framing or the masonry foundation walls.

The west wall is framed with salvaged 4 inch square studs.[391] This wall supports a load bearing beam. Nail patterns on these studs indicate that they backed horizontal siding or boards with an average exposure of 4½ inches fastened with cut nails. The other three walls are of unfinished cast in place concrete installed around 1916. The hand mixed concrete was poured from foundation sill to grade. The concrete walls are underlain by 8 inch concrete block laid in the 1950s when the basement was deepened. The concrete and masonry walls are in very poor condition. The exposed ceiling structure consists of original heavy timber construction overlain by original floor boards. Some of the timber pieces have been altered, drastically affecting the structural integrity of the floor system (See Structural Framing Systems). The wood strip floor is fastened to wooden sleepers laid over a roughly screeded concrete slab. The sleepers were leveled with patches of mortar. This floor was installed by the Wenzlicks and is in poor condition.

Basement Room 002

This space may have served as a root cellar during Dent occupation up until Wenzlick 1940 renovation work. According to three independent sources, this room had only about 4 feet of head room until the floor was lowered around 1940 to accommodate furnaces and other utility services (Figure 2.128). The soil floor merely spilled into the West Wing basement 003 at the southwest corner of 002.[392] This description of the pre-1940 basement is perplexing given the fact that the stone foundation walls are continuous to the present floor level. Mortar analysis of several areas on

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[390] Bill Wenzlick to the author, 24 February, 1992. A newspaper found cast into the bottom of the replaced east fireplace hearth bears the date of 21 January, 1952. This indicates that the work was carried out around 1952 since the ceiling had to have been open for work to proceed on the hearth. Wenzlick also recalled that some of the soil excavated to create this room may have been dumped into the West Wing basement area (Room 003) to raise that floor level. The remainder of the soil was spread over the grounds.

[391] Bill Wenzlick to the author, 2 February, 1992. Some of this lumber may have come from the Grant horse barn as his father was demolishing the stalls at that time.

[392] Bill Wenzlick to the author, 24 February, 1992, and James and Charles A. Davis to the author, 18 March, 1993. As a boy, Wenzlick climbed over potato sacks in this area to reach the crawlspace at the east end of the house. The Davises recalled hauling potato sacks into the space on their hands and knees.

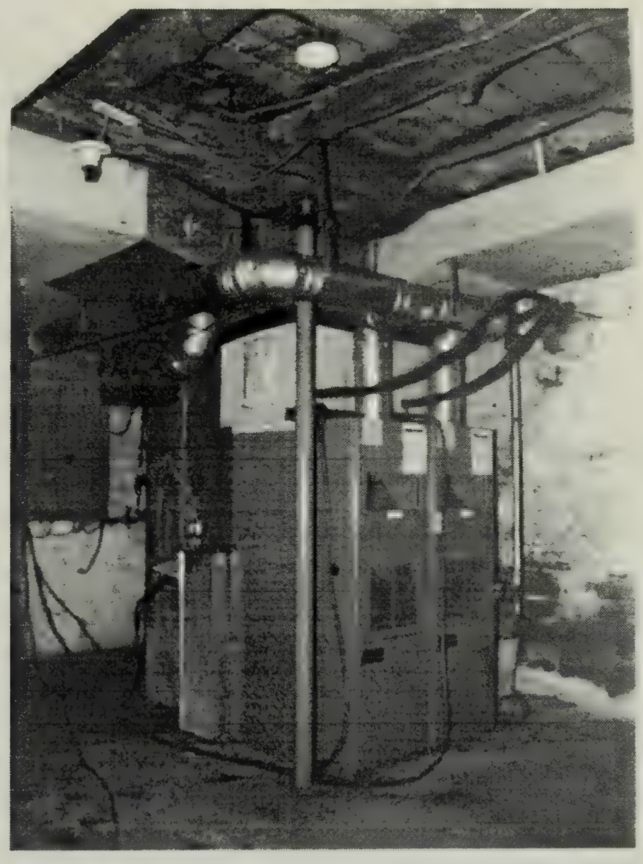

Figure 2.128 - Basement mechanical Room 002, 1994. Much of the historic ceiling system is concealed by mechanical equipment and ducts. This photograph was taken toward the southwest corner. (Photograph by the author, ULSG collections).

the north and south walls showed them to have been constructed with the early nineteenth century soil-based bed mortar.[393] There is no indication that the foundation walls were somehow extended deeper to compensate for excavation of the floor in 1940. Why, then, were the north and south foundation walls of Room 002 originally constructed 4 feet deeper than necessary? Surely Long would not have gone through the effort and expense of excavating trenches and laying stone 6 feet below grade, when 2 feet in depth would have been sufficient to support the house and provide some root cellar space.

Since there are no archeological remains of the original floor level in 002, answers to the above question are speculative. Perhaps 002 had been originally constructed as a full cellar, but backfill from the circa 1840 West Wing basement excavation may have been dumped into the room as a labor saving convenience. The Wenzlicks may have removed soil that had been excavated during construction of the West Wing basement.

If Room 002 had been a full cellar during the early nineteenth century, the question or for what the space was used for arises. Certainly the space would have been put to use for storage of food stuffs. But given the unusual characteristics of the existing central chimney stack, there is a possibility that 002 could have served as a kitchen (see Chimney Analysis, Central Chimney).

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[393] Arbogast, *Mortar Analysis*, 4-6. Samples M-002S-20, M-002S-23, M-002N-25, and M-002N-27.

Whatever its former use, there had to have been an external entry into 002. The crisp and plumb edges of the stone stem wall suggests that the original cellar entrance was at the southwest corner of the room next to the chimney stack foundation. There is a section of moulding fastened with cut nails to the skirt board directly above that opening. The skirt board is a remnant of the west exterior elevation of the main two story section of the house prior to concealment with the addition of the West Wing. The moulding may have been a part of that entry.

The south interior elevation and a portion of the north wall are of exposed original foundation stone. The West Wall consists of the whitewashed stone central chimney stack foundation and a small portion of gypsum and plywood finishes which were removed in 1991 for inspection purposes. A portion of the east side of this chimney stack may have been rebuilt by the Wenzlicks to install a furnace flue. The portion of the north wall shared with the restroom is plaster over metal lath installed by the Wenzlicks around 1940.

The east wall is presently constructed of gypsum wall board and shares the interior basement stair. There is no remaining physical evidence for the type of support that may have originally been placed beneath the girt now supported by frame wall. According to Bill Wenzlick, a soil mound sloped down from the former crawlspace in 001 into this room but he could not recall any supporting structure. However, from James Davis's recollections, there may have been crude stone piers supporting the girt, and the floor levels were about the same between the two spaces.[394] If these recollections are accurate, then the following picture is developed of how the Long House basement appeared prior to Wenzlick acquisition of the property: The central girt in the ceiling above the east wall of Room 002 was supported by an unknown number of stone piers. The floor level from the east end to the west end of the Long House basement was level or may have had a slight downward dip west of the girt. The dirt floor sloped down into Room 003 with no retaining wall.

The ceiling structure and underside of the floorboards are mostly exposed, although there is an abundance of sheet metal ducts hung from the structure and the north ends of several joists are concealed by the Bathroom 002-B ceiling (See Structural Analysis for structural member integrity). At least two of the log joist were replaced during the 1930s.[395] The existing concrete slab floor was poured during Wenzlick renovation work. Bill Wenzlick remembers a soil floor in this room until the 1940 renovation work.[396]

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[394] Bill Wenzlick to the author, 24 February, 1992, and James Davis to the author, 18 March, 1993. Wenzlick recalled that he had to crawl over sacks of potatoes to gain access to the crawlspace from Room 002, but Davis indicated that "there was just piles of rocks" between the two spaces.

[395] James and Charles A. Davis to the author, 18 March 1993. Each talked at length about replacing the joists with timber cut from the property. They described that the old timber was "like iron" when driving nails into them.

[396] Bill Wenzlick to the author, 24 February, 1992. Wenzlick recalled that the boiler was supported on a concrete or stone pad set upon the soil floor.

Stairwell 002-A

Stair S-3 was added by the Wenzlicks around 1940 as the first interior access to the basement.[397] Previous to that work the first floor space functioned as an under stair closet (See 1940 HABS drawings).[398] Walls beneath the first floor level consist of gypsum wallboard. Removal of the north wall finishes revealed the original foundation stone joined with the concrete block and concrete of the Room 001 foundation walls. Above the first floor level, the walls and sloped ceiling are finished in plaster. These plaster walls and ceiling are in fair condition.

Restroom 002-B

This space was constructed around 1940 by the Wenzlicks. Plaster and metal lath is laid over wood framing at the south and east walls and obscures the foundation stone at the west and north walls. The ceiling structure is also concealed by these plaster finishes. The concrete floor is contiguous with that of Room 002. The toilet and lavatory were salvaged from the second floor bathroom constructed around 1915.

Basement Room 003

With the addition of the West Wing to the Long House, this full basement was constructed to provide usable space. This space functioned in the least as a winter kitchen throughout the middle of the nineteenth century given the presence of the large cooking fireplace with remnants of pot crane gudgeons still mortared into the north edge of the firebox. Heavy smoke damage at the ceiling around the fireplace also attests to the frequent use of the fireplace. During Albert Wenzlick's ownership the room may have been used to house the central heat boiler, and possibly for storage.[399]

During the 1940s Delbert Wenzlick poured a concrete floor and used the space as a workshop (Figure 2.41). When shop equipment was moved to the workshop constructed adjacent to the Stone Building around 1950, a raised wood strip floor was laid over the concrete slab and vertical tongue and groove pine boards were installed to conceal the stone walls. The basement room served as an apartment for a hired hand, Shed Davis, and his wife, and later as an office for Delbert Wenzlick until his death in 1979.[400]

Removal of the wall board finishes in 1991 revealed several episodes of haphazard repointing, but the walls are in fair condition. Stone was added above the existing cellar walkout doorway by the Wenzlicks. The south, west, and north walls are constructed of rubble limestone set more crudely than walls in the basement at Room 002. The walls have been extensively repointed during the twentieth century as evidenced by the various mixes of portland cement based mortar. However,

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[397] Bill Wenzlick to the author, 5 September, 1990.

[398] Bill Wenzlick to the author, 16 April, 1992. Wenzlick recalled this space being a closet prior to 1940 renovation work.

[399] James Davis to the author, 18 March, 1993.

[400] Bill Wenzlick to the author, 24 February, 1992. Shed Davis performed much work around the house and grounds. Davis died of a heart attack while toweling the Barn concrete floor soon after the Barn was moved in 1962. Delbert Wenzlick died in his son Bill's arms in this room on 12 January, 1979 while giving a tour of his home to St. Louis County administrators.

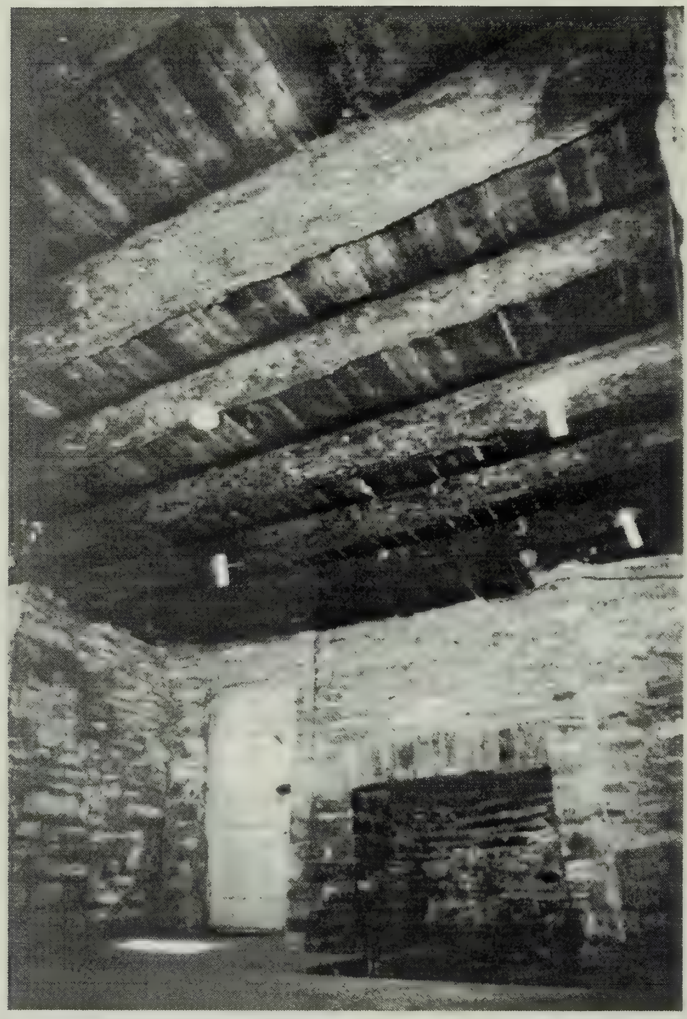

Figure 2.129 - Basement Office 003, 1994. The exposed unbarked log joists and cooking fireplace are the significant elements in this space. (Photograph by the author, ULSG collections).

there is a small area of joint work at the south wall which may be the only surviving example of original pointing work remaining in this space.

Door 005-D1 was punched through the north elevation masonry by the Wenzlicks when usable basement spaces were added in 1940.[401] A solid stone wall existed prior to 1940 in the northeast corner of the room presently occupied by Door 003-D2.[402] There is physical evidence that foundation stones have been broken to create the opening.

Exterior access to this room is gained through a cellar walkout at the west elevation. This existing walkout was modified by the Wenzlicks when the floor within the room it serves was substantially raised during 1940 renovation work.[403] The original door was approximately 4 feet high and constructed of vertical boards with strap hinges (Figure 2.14). In an 1860 photograph the door opening appears to be covered with horizontal wooden slats and a door cannot be seen (see Doors, 003-D1 and Figure 2.3). Upon passing through the door from the outside one would have encountered a steep stair, like a ship's ladder, down into Room 003.[404] The Wenzlicks revised the entry to step down from the exterior to eliminate internal steps and create a taller doorway.

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[401] Bill Wenzlick to the author, 24 February, 1992, and James Davis to the author, 18 March, 1993. Both gentlemen recalled that the north wall was solid stone with no openings prior to the 1940 renovation work which expanded the basement beneath the kitchen, or HABS Room 4. Archeology investigations and demolition of basement Bedroom 005 wall finishes may uncover physical evidence on this matter.

[402] James and Charles A. Davis to the author, 18 March, 1993. Each was adamant that the wall in this corner had been solid during the 1920s and 1930s.

The exposed ceiling displays impressively sized unbarked white oak joists with ax hewn tenons.[405] The bark has become brittle over time and some has peeled away exposing the underlying wood. The underside of the sub-floor boards are also exposed. There are also numerous nails, hooks, and electrical and telephone cables and fixtures fastened to the timbers and floor. The timbers and the floor boards are of high historic integrity although there is some doubt as to whether the floor system is original to the construction of the West Wing, or replaced the original floor system when the West Wing was moved and added to the Long House.

The current wood strip floor is laid over a frame of nominal 2 inch by 6 inch lumber. Beneath the frame is a 2 inch to 3 inch thick cast concrete floor with a drain hole centered on the floor. A coating of dry mud implies that this room is periodically subjected to high moisture levels. The room has been seen to flood on numerous occasions since 1991. Perhaps the reason for raising the floor is that the Wenzlicks chose to deal with water entry rather than attempting to seal the foundation.[406]

A portion of the wood floor and concrete slab were removed from around the fireplace in preparation for June 1992 archeological investigations of the underlaying soils. These excavations revealed that the original soil floor was no more that 9 feet 9 inches below the underside of the first floor boards. The investigation also uncovered the original stone hearth of the fireplace (See Fireplaces and Chimney Pieces, Fireplace FP1).

Basement Closet 003-A

This small space was constructed by the Wenzlicks at the same time Room 003 was remodeled, and therefore shares similar traits with that room. This closet actually served as a tiny kitchen for the hired hand who resided in the basement apartment.[407] Bill Wenzlick recalled that the boiler installed by his grandfather, Albert, may have rested on a pad in this space prior to the addition of wall and ceiling finishes.[408]

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[403] Bill Wenzlick to the author, 5 September, 1990. According to Wenzlick, the floor in Room 003 was much lower than now exists, and the fireplace hearth was at least knee high when one stood on the floor. Wenzlick also recalled during a 25 February, 1992, conversation that there were four or five steps from the door sill down to the soil floor level.

[404] James and Charles A. Davis to the author, 18 March, 1993. Each intimated that there may have been one or two steps down to the door at the exterior before the door was encountered. However, no exterior steps can be seen in any photographs. Charles Davis remembered the floor being at least 3 feet deeper and thought that the room had been filled in. But archeological excavations confirmed that no substantial filling had taken place.

[405] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 34. The article explicitly states that the log joists were hewn "...by an adz (not the ax)..." This is in error as an adz was used to finish wooden surfaces and not mortise logs. There are no tool marks indicating that an adz was used.

[406] Bill Wenzlick to the author, 24 February, 1992. Wenzlick believed that the reason his father Delbert raised this floor was to avoid periodic water problems.

All floor, wall, and ceiling finishes were removed from this space in 1992 to investigate concealed surfaces. The walls and ceiling finish were of ½ inch thick gypsum wall board and the floor wood strip. The exposed foundation revealed a stem wall at the south elevation. There is also a moulding placed at the foundation sill directly above the opening between Rooms 002 and 003-B; possible evidence for a cellar walk-in to the Room 002 root cellar prior to addition of the West Wing (See Furnace Room 002 Interior Finish Analysis).

The ceiling is mostly concealed by ducts which prevent close examination, but the ceiling structure appears to have been modified. The underside of the first floor boards are narrower when compared with the West Wing floor boards. This seems to insinuate that this portion of the Room 104 floor was rebuilt when the West Wing was added to the Long House. The floor in this area features a large stone slab in transition between the step-down from Furnace Room 002 to the West Wing basement Room 003. This stone was probably installed by the Wenzlicks at the time the Furnace Room 002 floor was deepened.

Bedroom 005
Closet 005-A
Bathroom 006

These spaces were constructed during the 1940 Wenzlick renovation work. One photograph taken around 1940 is believed to show the excavation work in progress (Figure 2.40). Previous to renovation work this area had been a crawlspace beneath HABS Rooms 4 and 5 indicated in the 1940 HABS drawings (Figure 2.22). The larger room (Room 006) served as a bedroom for housekeepers hired by Delbert Wenzlick.

The walls and ceilings of each of these spaces are finished in plaster over metal lath; the finishes are in fair to good condition. Some of the ceiling and wall finishes were removed in 1992 to investigate structural condition. The framing system beneath the wood strip floor is unknown, but is suspected to be similar to the floor system in Room 003. The floor is in fair condition.

Crawlspaces 007, 008, and 009

These areas were added by the Wenzlicks during 1940s and 1950s renovation episode. The walls are of cast concrete, the floors are soil, and the ceilings exposed structural framing.

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407. Bill Wenzlick to the author, 24 February, 1992. This "kitchen" had a hot plate and food storage only.

408. Bill Wenzlick to the author, 7 April, 1992.

Living Room 101

This room has functioned as a bedroom and living room since the property was acquired by the Wenzlicks in 1913.[409] There is no documentation as to the function of this space previous to Wenzlick ownership, but given its proximity to the front entry it could have served as a sitting, drawing, or dining room. The memoirs of Julia Dent Grant discloses the function of Room 101 during her life at the house in the 1840s. Perhaps the most revealing details about the former functions of many of the first floor spaces occur in an 1844 recollection of a surprise meeting with Ulysses. The lieutenant was to report for duty to New Orleans but his departure was delayed. Having just seen off some of her friends at White Haven and "...about to retire for an afternoon siesta...", Julia received word that Ulysses was approaching through the front gate. Julia continues with the story:

> As soon as I could arrange my toilet, I repaired to the sitting room and, to my surprise, found Lieutenant Grant in the dining room, not far from my door. He seemed to be expecting me. I was, of course, pleased at his return and told him so, saying, as we seated ourselves with the family in the drawing room, "How long do you expect to remain, Mr. Grant?"[410]

Assuming that Julia was referring to her bedroom door when she stated "...not far from my door," the sequence of rooms she encountered was as follows; bedroom, dining room, and either the sitting or the drawing room. At that point in time the first floor had at least four principal living spaces, the large Hunt Addition room (now demolished), the two Long House Rooms, 101 and 102, and the West Wing Room 104. It is possible, but unlikely, that the East Addition room had been constructed at that time (See Historic Building Chronology, Phase IV).

While the relationship between Julia's bedroom and the dining room is firmly established, the location of the sitting and drawing rooms are not. It appears from her memoir that the sitting room was next in line after the dining room, but it is very possible that she had to pass through the drawing room to get to the sitting room. Typically, the drawing room was located adjacent to the dining room as both spaces were considered formal areas to entertain guests.[411] The sitting room was considered a private family space not unlike today's family room.[412] In the case of the Main House, Room 101 may have served as the drawing room because the most formal and newest chimney piece had replaced one of the Long House chimney pieces by around 1840 (See Fireplaces and Chimney Pieces). While it was usually proper to locate the drawing and dining rooms adjacent to one another, it cannot be said for certain that this arrangement existed in this house.

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[409] 409. Bill Wenzlick to the author, 24 February, 1992. This was Wenzlick's bedroom when he was a boy, and recalled listening to the Amos and Andy Show radio programs while lying in bed "sleeping."

[410] 410. JDG, *Memoirs*, 49-50.

[411] 411. Henry H. Saylor, *Dictionary of Architecture* (New York: John Wiley & Sons, Inc., 1952), 58 (hereafter cited as Saylor, *Dictionary*).

[412] 412. Saylor, *Dictionary*, 157.

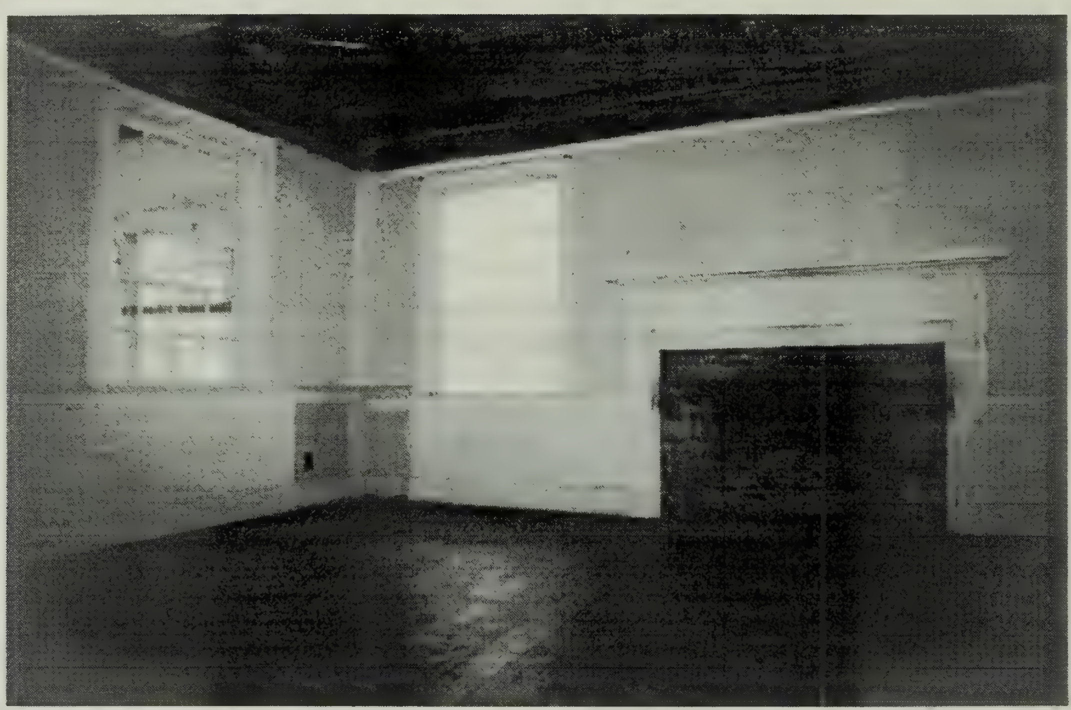

Figure 2.130 - Room 101 toward northeast corner, 1994. (Photograph by the author, ULSG collections).

In a memoir prepared by Emma Dent Casey, mention is made of a visit Ulysses paid to White Haven for the purpose of asking Frederick Dent's permission to marry Julia:

> ...after greeting the rest of us on the porch, he strode quietly into the sitting room where our parents were.[413]

This insinuates but does not in any way confirm that the sitting room was located near the front door in either of Rooms 101 or 103. Of course, Ulysses could have approached the house from the rear and entered the Hunt Addition from the more informal back porch. In 1916 Mrs. John C. Dent, sister-in-law of Julia, visited White Haven and indicated that the sitting room, or Room 101, "...was the place where Ben [Ulysses] Grant did his courting," but the accuracy of that article is in doubt.[414] There are two scenarios which satisfy the bedroom to dining room to drawing room to sitting room linear arrangement:

Scenario 1: Given the stated sequence of rooms, the path traversed by Julia could have originated in Room 104 (Julia's bedroom), moved into Room 103 (dining room), passing through Room 101 (drawing room) on her way to the Hunt Addition (sitting room). The Hunt Addition satisfies the requirement that the "family room" be isolated from the formal areas of the house. The formal areas were usually clustered within the core area of the house and easily accessible to guests through the front door.

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[413] Casey, *Grant*, 13.

[414] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 34. The article contains many errors and misleading information.

Scenario 2: Another possible sequence is that the Hunt Addition served as Julia's bedroom, Room 101 served as the drawing room, Room 103 the dining room, and Room 104 the sitting room. But the small Hunt Addition room would have been an impediment to Julia's contention that Grant was sitting not far from her bedroom door.

The most logical function of the rooms based upon Julia's account of circulating through the rooms is Scenario 1. Scenario 2 seems to satisfy most of the arrangements, but the historic room functions may never be confirmed until more substantive documentation is uncovered.

Originally, Hall 102 and Room 101 were joined as one large space until the addition of the present west living room wall (See Historic Building Chronology, Phases I and II). This wall was constructed prior to the Civil War, as physical evidence at the top of the West Wall shows that the framing is constructed directly against the underside of the original ceiling plaster and split lath finish. The frame members of this wall are fastened to the ceiling with cut nails.

Original wall and ceiling finishes for this room consisted of soft plaster over hand-split wood lath. Remnants of this system were found during the 1992 removal of the metal lath and plaster system installed in 1940 to replace the original finishes. A 1940 HABS photograph of the east wall shows that portions of the finishes were in poor condition at that time, particularly below the chair rail and in areas of the ceiling just above the fireplace and above the north wall (Figure 2.33). The photograph also shows split lath in areas where the plaster had fallen or been removed.

The north and west walls are furred out to accept sheet metal ducts and plumbing systems within wall cavities. As a consequence, door and window casings were modified to accommodate the thicker wall. The existing wall finishes are in good condition although the plaster was not applied to the top 10 inches of each wall due to installation of a suspended plaster ceiling.

The ceiling finishes were totally removed in January 1992 when it became apparent that severe deflection existed in the ceiling's structural framing. The ceiling finishes consisted of portland cement based plaster over metal lath. The entire system was supported by steel channel suspended by wire from the original wood structural framing. This work was carried out during 1940. Since the framing had deflected by about 6 inches at the center of the room near the fireplace, the Wenzlicks concealed the condition by removing the original finishes and suspending a level ceiling rather than dealing with the structural problems. This resulted in the ceiling being about 10 inches lower than the original level. Cut lath nails, plaster stains, and bits of split lath and plaster at the underside of the structural framing are all that remain of the original finishes.

There is no apparent physical evidence that there was any ceiling finish other than the original split lath and contemporary suspended plaster systems. Yet, it is strongly suspected that the ceiling structure began to deflect soon after the circa 1840s installation of the west wall and maybe even at the time the framing was installed in 1818 (Structural Framing Systems). Surely there had to have been plaster patches made to the severely cracked original finishes due to the bowed ceiling. Bill Wenzlick could not recall large cracks or patches previous to 1940, even though he would have had a propensity to view the ceiling on a daily basis as this room served as his bedroom.[415] However, the image of a patch and some cracking appears in a 1940 HABS interior photograph of this room (Figure 2.33).

The existing floor material is tongue and groove yellow pine nailed to sleepers laid over the original floor boards. From examination at the basement and measurements made through the top floor, the original floor surface is fairly level. The original floorboards are in good condition at the underside in the basement except for one large duct hole at the northeast corner of the room, and the presence of large nails used to fasten the sleepers to the original floor. In Figure 2.33 the floor material appears to be intact and level with little deflection. Inspection of the original top floor surface could be made only at the duct hole in the cavity formed by the sleepers. The section of floor that could be seen was found to be in good condition with slight cupping of the boards causing shallow ridges at joints.

Living room baseboards were raised in response to the floor level established in 1940. Paint analysis reveals that most of the baseboards had been replaced in 1940. The quarter round base shoe appears to have been a Wenzlick addition as all shoes are of recent vintage. Figure 2.33 shows no such quarter round base shoes, and paint marks of former shoes could not be found at the base of the northeast corner post casing when it was examined at the cavity formed between the 1940 and original floors.

Physical evidence and paint analysis of the existing chair rails and two corner post casings indicate that these are original to the initial construction of the house.[416] It also appears that plaster finishes have been placed around these mouldings as was customarily done, rather than the mouldings fastened directly to the plaster surface. A 1940 HABS photograph of the east exterior elevation of the house (Figure 2.25) clearly shows the back side of the chair rail in areas where siding had been removed. This confirms that the chair rails were extant at that time. A small portion of the southeast corner post can also be seen in this same photograph just behind the bottom of the stud.

Front Hall 102

Physical evidence suggests that this space was created when the partition (the east wall of the hall) which now separates this room from the adjacent living Room 101 was installed during the 1830s. It has probably always served as a central hall since the addition of that wall. At the time the east wall was installed a portion of the east wall boxing Stair S-1 was removed to create a partially open stairwell. Examination of the condition of the floor in a 1940 HABS photograph (Figure 2.32) of the interior of this room indicates that the stairwell wall extended to the south wall where the front door now exists. Board patches covered pockets where the walls had been placed. There are subtle differences in detailing between this stair and Stair S-2 to the attic. In addition, there is a double vertical paint line at the post casing at the north wall of the hall. There may have been a narrow partition fastened to the post casing which partitioned the stair from the room. Paint analysis of this area was inconclusive however.

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[415] Bill Wenzlick to the author, 24 February, 1992.

[416] Bill Wenzlick to the author, 24 February, 1992. Wenzlick recalled the chair rails being present in this room at the time he was a child.

The walls are finished in plaster over circular sawn wood lath. This lath may have replaced original split lath when the east wall was added and the west wall moved. The existing walls are in good condition except for mechanical and electrical devise penetrations. The ceiling plasters have been replaced, but wood lath remains. The plaster is in good condition.

When viewed from the basement, the original floor appears to be intact. These floor boards are butt joined above the girder placed directly beneath the middle of the hall as board widths east of the beam do not match those west of the beam. Figure 2.32 confirms the joint line and rough board patches. If the original floor surface is exposed the continuous joint down the center of the hall may pose a trip hazard. According to paint analysis, all baseboards have high nineteenth century historic integrity. The installation of a return air duct near the door has severely damaged one baseboard.

Beaded casing conceals a heavy timber post at the north wall. The casing is fabricated identically as corner post casing throughout the rest of the Long House. The casing is of original construction as revealed through paint evidence and comparison of profiles with other corner posts.

Stairwell 102-A

Physical evidence indicates there has always been a stair of the existing configuration in this location. Examination through a twentieth century access hatch of original floor boards beneath the stair landing revealed that the finished surface remains in a crisp unscuffed condition, having never been used as a circulation route. However, the balustrade is believed to have been added at the time the east wall of this space was opened into the hall around the 1840s. The treads, risers, hall nosings and trim from the original stair may also have been totally replaced at that time (see Stairs).

The west wall is finished in split lath and lime plaster; the lath parallels the pitch of the staircase. The north wall is finished in sawn lath similar to that of the hall. The lath system at the sloped ceiling is unknown. All finishes are in good condition (see Stairs for millwork analysis).

Dining Room 103

The historic function of this room is undocumented; its current title refers to its most recent use. Similarly to Room 101, this room could have historically functioned as a dining, or sitting room during the Dent period of occupation (see Living Room 101 analysis). There is a strong possibility that the room served as a dining room during Long occupation. The space served as a living room during Albert Wenzlick's ownership and was later designated as a dining room by Delbert Wenzlick.

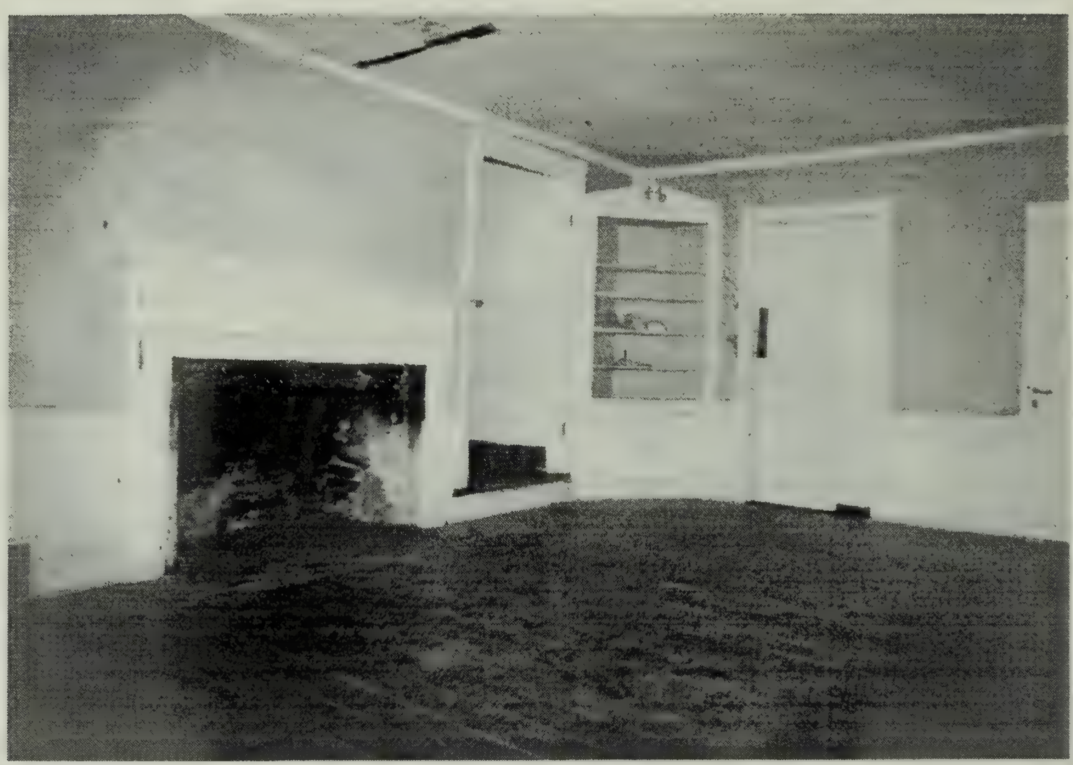

Figure 2.131 - Room 103 toward the northwest corner, 1994. Photograph by the author, ULSG collections).

Original split laths remain at the west and north elevations and the south third of the east wall, but all original plasters have been replaced. Wire lath and plaster is on the remainder. The northern two thirds of the east wall is furred out to accommodate ducts in the wall cavities. Wall finishes are in good condition except for mechanical and electrical penetrations and a large settlement crack at the fireplace mantle.

The ceiling is plaster and split lath, original to the construction of the building. There are no major ceiling cracks even though there is a severe sag in the ceiling adjacent to the fireplace. Except for one electrical fixture penetration the ceiling finish is in good condition.

Paint analysis reveals that baseboards are of high nineteenth century integrity. The baseboards may have been moved around during twentieth century renovation work but they are all in good condition. The chair rails are original to the Long House according to physical evidence and paint analysis. A length near the fireplace was removed for installation of a vent and a portion of the east wall rail had been moved in response to that wall being furred out.[417] Paint analysis indicates that the corner post casings are authentic to the construction of the Long House.

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[417] Bill Wenzlick to the author, 24 February, 1992. The chair rails were present in this room at the time he was a child.

Samples of wallpaper believed to have come from Room 103 complement the grey interior paint episode. The top layer has a Rococo-Revival foliated pattern that was block printed and manufactured in France between 1845 and 1855. The design is printed on a polished "satin" ground. Papers of this type were expensive and usually found in the homes of wealthy people. It is unknown when the wallpaper was applied however. Two other papers underlay the Rococo-Revival paper. The base paper features an oak leaf design block printed in two colors. The paper was manufactured during the 1840s. The second paper has a stripe with scrolling elements design, block printed in green, white, and grey. This paper was manufactured during the 1840s and 1850s.[418]

Bedroom 104

According to physical evidence, this room was added as part of the West Wing to the Long House during the 1830s (See Historic Building Chronology, Phase III). Although used as a dining room by Albert Wenzlick and as a bedroom by Delbert Wenzlick, documentary information on nineteenth century functions is scant (Figure 2.132). Ulysses S. Grant Jr. wrote that this may have been the room in which some of the Grant children were born, and therefore may have been his parents bedroom during the time they lived in the house.[419] The room may have been Julia Dent's room prior to her marriage to Ulysses (see Living Room 101).

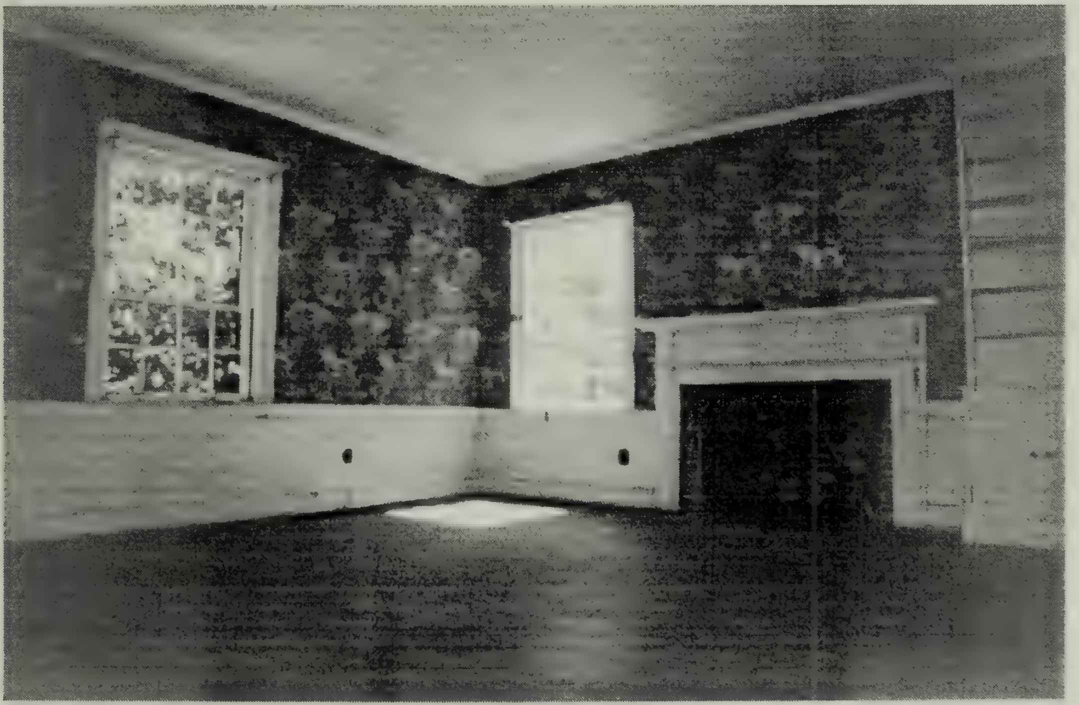

Figure 2.132 - Room 104 toward the southwest corner, 1994. (Photograph by the author, ULSG collections).

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[418] Joanne Kosuda-Warner, letter to the author, 15 March, 1993. See also Appendix E, Wallpaper.

[419] Wenzlick Papers, U.S. Grant Jr. Letter to Albert Wenzlick, 8 October, 1926. "The south room [Room 104] may have been the very one in which the children were born." U.S. Grant Jr. also indicated that his three siblings were born "supposedly" in the house, but continued that Jesse Root Grant claims to have been born at Hardscrabble. Another source indicates that three children were born in the house. "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 34.

Walls and ceilings are finished in plaster and sawn white pine lath nailed over a vertical log structural system. Circular sawn lath predominates while some vertical sawn lath was found on ceiling lath exposed in the attic. The wall lath is fastened to heavy vertical logs with cut nails. There is no indication that any other lath system predates the lath that now exist. An examination was made of cavities between these logs at an access hole made by during investigation work initiated by St. Louis County. The bottom 18 inches of the cavities are filled with soft plaster keys indicating that original plasters had been removed while the lath was probably left in place by the Wenzlicks for the installation of a new plaster system.

The Wenzlicks overlaid the old floor with new boards on sleepers. Previous to that work straw matting covered the floor (Figure 2.19).[420] A portion of the top floor was removed from Hall 104-A in 1993. Beneath it lies a ⅞ inch by 3¼ inch tongue and groove floor finished with dark green paint. Much of this floor in the hall had been removed to level the top floor. Remnants of the Wenzlick straw matting were found on the green painted floor during that investigation work. A 1 inch thick yellow pine[421] tongue and groove sub-floor can be seen from the basement, and a top surface portion exposed in Hall 104-A. It is unknown if the tongue and groove boards were initially intended to serve as a subfloor, or if this is an original floor with a later wood strip overlay. The lower flooring is vertical sawn and the tongue and groove profiles are mechanically planed. These boards are between 4½ inches and 7½ inches wide in one inch increments. The floor installer may have worked from the south wall to the north because the wider material is concentrated at the south wall and diminishes to narrower boards at the north wall. All surfaces of this floor material are sawn which indicates that it was produced sometime after the installation of the Long House flooring. Uniform blade bite marks ½ inch wide indicate that a more powerful saw was used on these boards than on Long House floor boards.

Baseboards in this room differ from those in the two story portion of the house. Paint analysis indicates that the baseboards have high nineteenth century integrity. The baseboards appear to be in good condition although covered with heavy coats of paint. Although the chair rail profile matches closely with that in Rooms 101 and 103, all of the chair rails in this room were added by the Wenzlicks.[422] The rail is surface applied to the plaster, rather than the fastened to the underlying framing. The chair rail is not integral with window stools and aprons as with the Long House rooms. Paint analysis indicates that the rails are of recent vintage.

Hall 104-A

This small hall was created to give passage between the Long House and the West Wing. During the nineteenth century this small space also provided key circulation between the rear porch and the

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[420] Bill Wenzlick to the author, 24 February, 1992. His grandmother installed the straw mats with nails, and that the mats were removed by his father prior to installation of the overlay floor.

[421] Alden, sample W-003C-41.

[422] Bill Wenzlick to the author, 24 February, 1992.

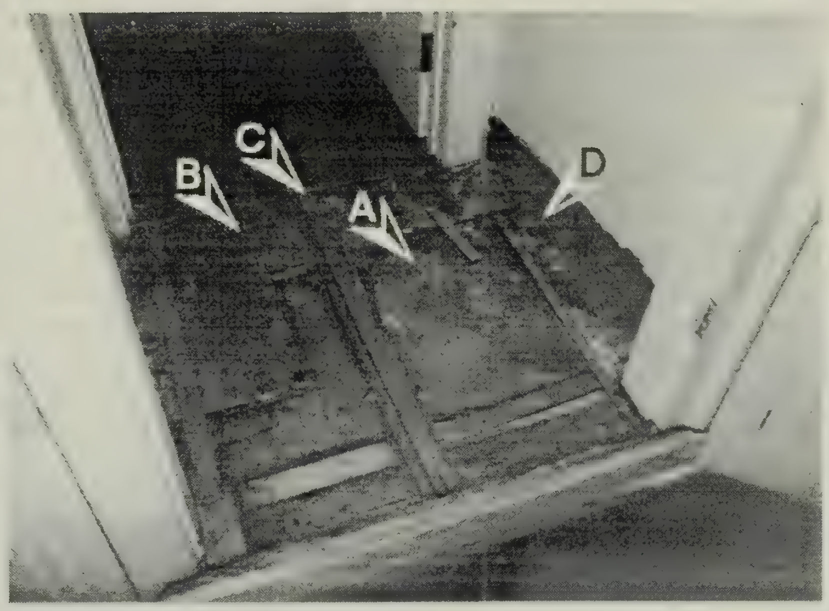

Figure 2.133 - Hall 104-A toward the northwest, 1994. Three floor systems were discovered during 1993 physical investigation work; the original finish floor or sub-floor at **A**, the wood strip floor at **B**, and the wood strip floor and sleeper installed in 1940 at **C**. A fragment of a woven straw floor mat was found stapled to the wood strip flooring at **D**. Concealed Door 108A-D1 was found adjacent to the mat. (Photograph by the author, ULSG collections).

Main House interior. In 1993 a door was discovered concealed within the north wall of the hall. The door probably provided entry to household slaves or servants serving meals to the dining room.

All wall and ceiling finishes have been replaced with metal lath and plaster by the Wenzlicks, probably soon after modifications were made to the adjacent chimney stack (see Chimneys). The north wall concealing the door retains wood lath however. The floor is contiguous with adjacent Room 104. The top floor was removed in 1993 to determine the level of the historic floor (Figure 2.133). Below the top floor was found a green painted, tongue and groove board floor (see 104 analysis). In Figure 2.19 there is an image of a very short baseboard at the south wall, measuring perhaps 1½ inches in height. At present, there are 5 inch wide plain baseboard at the north and south walls. Paint analysis indicates that the baseboards have not been in place for very long.

Closet 104-B

Wood finishes discovered beneath wire lath and plaster surfaces provided a clue to the previous function of this small space. A large hole punched in the east wall during St. Louis County ownership indicates that this wall was finished in horizontal tongue and groove white pine[423] boards. These boards conceal Long House siding. From the attic space above, the back surfaces of these boards can be seen over the entire east wall. A board ceiling, which includes one length of beaded board, can also be seen in the attic space.

Bill Wenzlick recounted second hand recollections that this space was a breezeway at one time prior to being infilled.[424] There is no readily apparent physical nor documentary evidence to indicate the previous existence of an exterior opening through the south wall or even a porch structure. However, when viewed from the basement the yellow pine[425] subfloor boards are not contiguous with that of Room 104 and are not of the same material. Perhaps the change in material was the result of construction modifications when the West Wing was added to the Long House.

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[423] Alden, sample W-104BE-21.

[424] Bill Wenzlick to the author, 5 September, 1990.

Dressing Room 106

This space was added to the house sometime between the Civil War and 1875, and substantially renovated by the Wenzlicks in 1940. It is labeled as "Room 4" in the 1940 HABS drawings. This room was added when a portion of the rear porch beneath the West Wing roof canopy was enclosed. The exterior enclosure is not extant in the earliest photograph of the house, and no porch deck can be seen (Figure 2.3). By 1875 the area beneath the porch had been enclosed to form this room (Figure 2.6).

The use of this space previous to Wenzlick occupation can only be speculated. Given the fact that two exterior doors opened into the room, this room probably functioned as a kitchen since its construction (See 1940 HABS Drawings, Sheet 1).[426] By 1913 a brick chimney was present along the west wall (Figures 2.13. and 2.14). The chimney was probably supported by a bracket fastened to the wall as there is no evidence that the stack continued to the ground. No brick masonry can be seen in the crawlspace beneath the kitchen in Figure 2.22. A length of salvaged historic chair rail from the room (Artifact 23) is believed to have come from between the former window in the west wall and the northwest corner of the room. If the chimney had been supported at the ground level, then the chair rail could not have been installed in a single, continuous length.[427]

The room served as a kitchen during Albert Wenzlick's occupation. During that time a sink was located against the south wall near the southwest corner, a Kelvanator refrigerator in the southwest corner, and an electric stove along the west wall at the northwest corner. There is believed to have been no fixed cupboards.[428]

Delbert Wenzlick drastically changed the space during 1940 renovation work. He was responsible for moving the partition separating Dressing Room 106 from Bathroom 107 east by about 2 feet, raising the floor level by at least 12 inches to match the Room 104 floor level, replacing nearly all wall and finishes, and replacing all of the windows and doors (see Windows). A hewn 4 inch by 5 inch beam at the top of the north wall of the room may have been in place since construction of the second north roof over the West Wing. The beam verifies the historic location of the north wall.

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[425] Alden, sample W-003BC-47.

[426] Marjorie Abbott Felice Letter to William Bodley Lane, 5 August, 1987, 3, and Bill Wenzlick to the author, 24 February, 1992. This room functioned as a kitchen during Albert Wenzlick's ownership, who referred to it as a "lean-to" kitchen. There is a strong possibility that this room has always functioned as a kitchen. Prior to the Civil War, cooking and food serving chores had been the domain of the Dent family slaves. Soon after Grant's caretaker, William Elrod, moved into the house around 1868, it is probable that Elrod and his family were inconvenienced by the remote locations of the Stone Building and basement kitchens with respect to the Main House dining room. Elrod's family more than likely were not wealthy enough to hire household servants to prepare and serve meals. A ground floor kitchen integral with the Main House and convenient to the dining room may have been constructed soon after Elrod moved into the house.

[427] The profile of Artifact 23 was found to match a paint ghost on a back band from the north casing of the west wall window (Artifact 9). The 65½ inch length of the chair rail compares favorably with the distance between the former location of the window and the northwest corner of the room. The north end of the chair rail is bevel cut to join with a former north wall chair rail.

[428] Bill Wenzlick to the author, 24 February and 30 November, 1992. Wenzlick vividly recalled that the room served as a kitchen during the 1920s and 1930s as he used to sit on the step between the West Wing and this room watching "Tilly the cook." James Davis recalled during an 18 March, 1993 interview with the author that the appliances were electric.

Only the south wall and ceiling of Room 106 contain original sawn white pine[429] lath fastened with cut nails. The remainder is wire lath. Some of the wood lath is circular sawn but the bulk is vertical-sawn, and all finishes have been replaced with gypsum plaster.

The condition of the Dressing Room ceiling finishes is very poor principally due to a chronic roof leak near the north wall and the removal of a large ceiling section during a St. Louis County physical investigation. Water leaks have moderately damaged the north wall of the Dressing Room.

As previously stated, the floor level was raised by the Wenzlicks. According to the 1940 HABS drawings there was a single 9½ inch step-up from HABS Rooms 4 to HABS Room 1. By examining the existing floor structure through a basement mechanical hatch it was found that little if any of the original structural elements remain.

Although most of the interior millwork has been removed, many pieces found on the site and in the house may have come from the old HABS Room 4. A paint color layer unique to any other room in the house, turquoise, is shared by the salvaged millwork pieces. The north casing and frame of Door 104-D3 were found to be the only in-situ millwork with the turquoise layer.[430] This ties all turquoise painted millwork found on the site to this room. Turquoise paint was applied to interior surfaces after the dark green layer marker. The turquoise coat may have been applied during late Grant, Conn, or early Albert Wenzlick ownership.[431]

Stone Building Door D-3, currently on the north elevation, is believed to have come from the south doorway in the 1940 HABS Room 4, or Door 104-D3.[432] A four panel door of similar style can be seen in Figure 2.22.

The south casing of Dining Room Door 103-D4 has a turquoise paint layer.[433] Door 103-D4 replaced a window in 1940 (see Doors, 103-D3). The Wenzlicks salvaged the casing from another door from HABS Room 4 when that room was demolished in 1940. Since the opening for the casing

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[429] Alden, sample L-106C-05 and L-106C-06.

[430] WUTA, sample P106S-148.

[431] Bill Wenzlick to the author, 14 April, 1994. Wenzlick recalled that the color was referred to as "blue" during Albert's ownership.

[432] WUTA, samples P(SB)N-593 and -594. The direction the door would have opened is consistent only with the 104-D3 opening. Also, the color chronologies on each side of the door compare favorably with corresponding trim colors found in Room 104 and the old Room 106 salvaged millwork.

[433] WUTA, sample P103N-49.

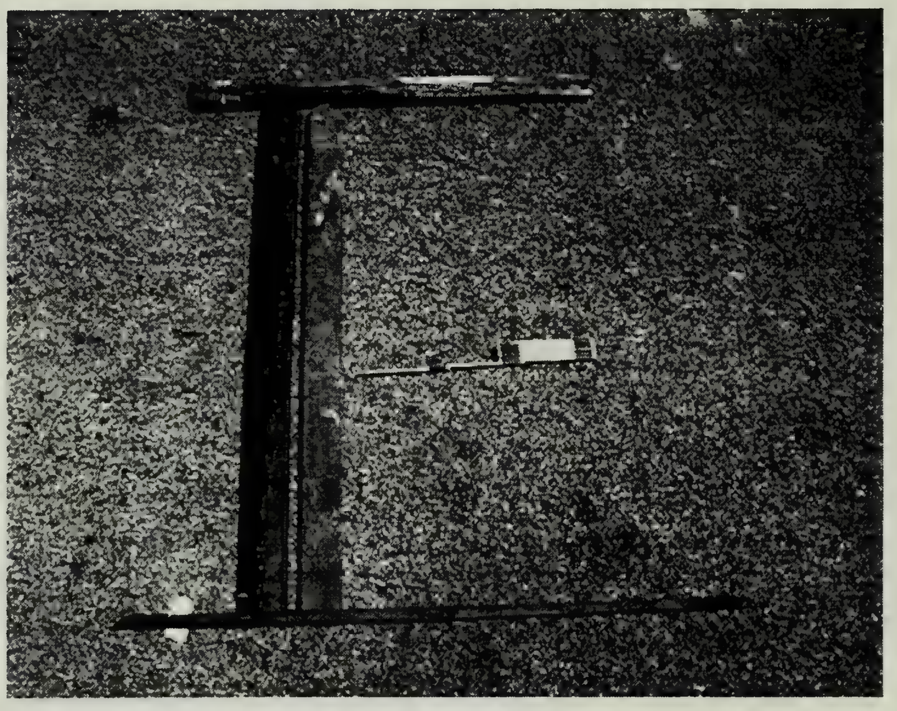

Figure 2.134 - Salvaged wainscoting millwork pieces from the 1940 HABS Room 4, 1994. These and other pieces of wainscoting were found in various places at the site. Each of the pieces has a turquoise layer of paint originating from the HABS Room 4. When assembled, a significant character defining element of that room is revealed. At the top is a length of moulded chair rail (Artifact 20) that was nailed to the wall surface with cut nails. At the bottom is a quarter round which simply finished the base. The two vertical beaded boards (Artifacts 95 and 93) are wainscotting remnants. Paint lines on these boards are consistent with the profiles of the chair rail and quarter round. (Photograph by the author, ULSG collections).

measures 35 inches wide, it is assumed that the casing came from the east door of Room 4 which opened on to the rear porch.

A salvaged door jamb casing backband (Artifact 17) and head casing (Artifact 12) may be from the door seen in the north wall of HABS Room 4.[434] The width of the salvaged backband matches the corresponding paint mark on the casing. The backband is narrower and has a simpler profile than found throughout the Long House and Door 103-D4 casing. The same backband profile is found on the south casing of West Wing Door 104-D3. This may signify that the Room 4 north door and 104-D3 were installed at the same time, possibly when Room 4 was added to the West Wing.

A ¼ inch by 2 inch trim strip (Artifact 18) may have been a jamb stop on the north door casing. Similar stops were found on Door 104-D3.

The sash in bedroom Window 201-W2 are believed to have come from the north window of HABS Room 4 (Figure 2.22). Each have a layer of the turquoise paint marker layer.[435] The sash were salvaged from the HABS Room 4 window and installed in a new window opening created by the Wenzlicks in 1940.

A piece of jamb casing (Artifact 15) and a length of backband moulding (Artifact-9) are believed to have been from the window in the west wall of HABS Room 4.[436] The window is thought to have been the tallest in the house (Figure 2.14). With these two pieces the atypical height of that window was determined. A head casing backband (Artifact 16) may also have come from this window. The backband profile matches that of the north casing of Door 104-D3 which had been doubled up to compensate for the application of plaster when Room 4 was added (see Doors, 104-D3).

It is believed that HABS Room 4 had wainscotting and chair rails. Four pieces of chair rail (Artifacts 20, 21, 22, and 23) and two pieces of tongue and groove beaded board (Artifacts 93 and 95) were found in separate places on the site (Figure 2.134).[437] All of these millwork pieces have the turquoise color marker layer.[438] The salvaged chair rail matches profile drawings of chair rails found in late nineteenth to early twentieth century millwork catalogs.[439] Assembly of the salvaged millwork indicates that the top of the chair rail in the former room was about 46 inches above the floor level. The radius of three pieces of quarter-round with turquoise paint corresponds with paint marks found in the end of the wainscotting (Artifacts 39, 40, and 41). It is believed that the quarter-round finished the base of the wainscotting rather than baseboard elsewhere in the house. The former location of the salvaged quarter-round pieces with respect to HABS Room 4 is unknown at this writing. All of the above pieces have physical evidence of cut nails indicating that the millwork was installed prior to Wenzlick ownership. A piece of salvaged casing backband (Artifact 24) is unusual because of its short length. However, the piece may have been cut after removal from a window or door. Which door or window it may have come from in HABS Room 4 is unknown.

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[434] 434. WUTA, sample P-ART12-556 for Artifact 12. Artifact 17 was not analyzed.

[435] 435. WUTA, samples P201S-218 and -219.

[436] 436. WUTA, sample for backband P-ART9. Artifact-15 was not analyzed.

[437] 437. When the lengths of the chair rails are compared with the interior elevations of HABS Room 4, it was found that Artifact 20 was located between the northwest corner of the room and the north elevation window; Artifact 21 was located along the east wall between the northeast corner and the east door; Artifact 22 was located at the east wall between the southwest corner of the room and the east door; and Artifact 23 was placed at the west wall between the west wall window and the northwest corner of the room. The former location of the wainscotting pieces is unknown.

[438] 438. WUTA, sample P-ART39-563 for Artifact 39, and sample P-ART20-562 for Artifact 20.

Bathroom 107
Closet 107-A

These two rooms are remnants of Room 5 indicated in the 1940 HABS drawings. Room 5 probably enclosed a portion of the rear porch seen in Figure 2.3. The first floor plan of the HABS drawing shows what appears to have been a porch post embedded into the northwest corner of the room. It is believed that HABS Room 5 was constructed during Luther Conn ownership, but there is no graphic or other documentation on the room until 1913. The room may have served as a mud or store room. Physical investigation revealed that original West Wing siding and Door 108A-D1 concealed beneath the south wall plaster of Closet 108A were painted in the two-tone green exterior scheme indicating that the area functioned as an open porch after 1874 (see Materials Analysis, Paint).

Prior to 1940 renovation work which transformed the space into a bathroom, Room 5 was used as a pantry, and as a cooling room to store milk crocks.[440] Although 1940 HABS drawings do not indicate as such, a door leaf existed between Rooms 4 and 5 in the HABS floor plan. The south wall of Room 5 had exposed siding. It is believed that the west wall was finished in siding or boards as this wall was exposed to the exterior prior to the addition of Room 5. The remaining walls and ceiling are believed to have been plastered.[441]

In 1940 Delbert Wenzlick gutted Room 5 and removed all of its walls. The eastern 5 feet of the room was demolished and absorbed by the what is now know as Breakfast Room 108. The west wall was also demolished and the new wall placed about 2 feet west of the old wall. The north exterior wall was completely rebuilt to accommodate a plumbing chase. All original finishes were removed and replaced except for some wood lath at the western portion of the south wall of Closet 107-A. Most of the original ceiling framing members and a hewn 4 inch by 5 inch north wall plate remain however. As with adjacent Room 106, the floor level was raised to match the Room 104 floor level. It is believed that the floor was the old porch deck. The door which opened onto the now demolished porch is believed to have been salvaged for use as Door 109-D1 (see Doors, 109-D1).

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[439] E. L. Roberts & Co., *Roberts' Illustrated Millwork Catalog, A Sourcebook of Turn-of-the-Century Architectural Woodwork* (New York: Dover Publications, Inc., 1988), p. 409, no. 8223, and *Catalogue of Western Sash and Door Company* (Kansas City, Missouri: Western Sash and Door Company, 1899), p. 316, no. 8211.

[440] Marjorie Abbott Felice Letter to William Bodley Lane, 5 August, 1987, 3, and Bill Wenzlick to the author 30 November, 1992. There were a porcelain four-door refrigerator against the south wall that was used until the 1960s. The cooling coils were in the upper left compartment and the compressor and coils were placed in the basement. The compressor and coils which remain in the basement were used for that refrigerator although the compressor has been changed.

[441] Bill Wenzlick to the author, 30 November, 1992. While Wenzlick recalled the siding on the south wall, James Davis indicated during an 18 March, 1993 interview that the entire room had been totally plastered.

The existing finishes consist of plaster and expanded metal lath on the walls and ceilings. The floor and a portion of the walls have ceramic tile. There is severe water damage to the plaster finishes, and the paint has peeled from the ceiling. The fixtures remain in service but are in poor to fair condition.

HABS Room 5 is believed to have been finished in the two-tone exterior green scheme from the 1870s until 1940 when the room was demolished. Both surfaces of Door 109-D1, and the exterior surface of Door 108A-D1 follow the color chronology of cream, light grey, and dark green found on the rest of the house (see Doors, 108A-D1).

Breakfast Room 108
Pantry 108-A
Kitchen 109

These spaces were all constructed by the Wenzlicks during the 1940 renovation work and subsequent additions around 1950. The existing spaces replaced the open rear porch and a portion of the HABS Room 5. None of the fabric within these rooms has any nineteenth century integrity except for siding beneath the south wall, and Doors 103-D4 and 109-D1. The bulk of the finishes in these rooms are of plaster over metal and gypsum lath. The south walls of the breakfast room and kitchen however, are finished in plaster over diagonal wood lath fastened with wire nails. This system overlays original exterior siding which remained exposed until 1940 renovation work (Figure 2.38). Why the Wenzlicks chose wood lath over metal lath at this particular wall since they had used metal lath throughout their renovation work is unknown. There is no documentary evidence for any other additions in this location previous to 1940. Perhaps the presence of the siding required substantial furring to level the wall.

One of the most surprising finds during physical investigations on the house was the discovery of a door hidden within the modest kitchen pantry. The door had been concealed within the plastered south wall since 1940. It provided circulation between the rear porch and the dining room during the nineteenth century (see Doors, 108A-D1).

Breezeway 110

This glass enclosed space was added in two phases by the Wenzlicks after 1940 and joins the house to the Stone Building. Other than the fact that a portion of the breezeway lies over possible archeological remains of the Hunt Addition, this space has no nineteenth century integrity.

Bedroom 201

There is no reason to believe that this room has functioned for any other purpose than as a bedroom (Figure 2.135). When initially constructed this room also included space now occupied by existing Bathrooms 206 and 207. The north wall of the bedroom was constructed by Albert Wenzlick around 1920 to partition off space for the installation of a single long narrow bathroom.[442] This wall addition has greatly affected the scale and light quality of the space, stressed second floor structural members, and offset the fireplace with respect to the center of the east wall. The west wall was furred out around 1940 to accommodate forced air ducts.

The only photo documentation of this room is a 1940 HABS photograph of the fireplace (Figure 2.35). The photo gives some insight into the wall and floor finish condition prior to extensive Wenzlick renovation. In the photo, the east wall appears to have had major cracks adjacent to the fireplace masonry. The cracking in this area continued even after finishes were totally replaced in 1940.[443] At present, all original wall finishes have been removed and replaced by gypsum plaster and wire lath. The original split lath system remains on the ceiling however.

The present exposed floor installed in 1940 overlays the Long House floor. Examination of the floor framing system from the room below indicates that the original floor boards are probably in good condition. But the floor is extremely unlevel due to the deflected structural members. The floor slopes down from the north, south, and west walls toward the fireplace hearth by as much as 6 inches. An insufficiently sized and detailed floor structural system, combined with loads added after initial construction and damage to structural framing to install mechanical systems has contributed to the deflection. There are indications that this condition has been in existence since at least 1915, and possibly since the Long House was constructed in 1818 (see Structural Framing Systems).[444] The 1940 HABS photo of the fireplace shows substantial floor settlement adjacent to the south leg of the fireplace, confirming that structural problems existed at that time. The painted floor appears to have been in good condition when the photo was taken.

Some of the baseboards in this room may not be original to Long House construction. A portion of the north wall of this room, added around 1915, is visible in Figure 2.35. It shows a baseboard which differs in profile from the perimeter wall to which it abuts. The existing baseboard now matches the original profile; an indication that the Wenzlicks were active in matching original work as much as possible. However, paint analysis is inconclusive in determining the integrity of the north baseboards. The southeast post casing is historic with respect to the Long House construction.

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[442] Bill Wenzlick to the author, 19 December, 1991.

[443] Bill Wenzlick to the author, 16 April, 1992. The fireplace moved up and down seasonally and continued to crack between the masonry and the wood frame portion of the wall. He tried several repair methods before a successful solution was found although he couldn't remember what that solution was.

[444] Bill Wenzlick to the author, 24 February, 1992. Wenzlick recalled that his grandmother, Emma Schall Wenzlick, kept her bed in this room against the west wall, and that four-by-fours were needed under two legs to keep the bed on an even keel. Wenzlick also recalled a story told to him by his grandmother that grain was stored in this bedroom during the Civil War. Wenzlick went on to state that during 1940 demolition work on the living room ceiling, his father Delbert found loose grain within the joist cavities beneath the bedroom floor. The grain may have been moved to the floor cavities by rodents however. Small corn cobs have been found in attic spaces of the house during investigation work.

Closet 201-A

This closet was added by the Wenzlicks as evidenced by its absence in the 1940 HABS drawings. Therefore it has no nineteenth century integrity. The historic baseboards have been replaced.

Stairhall 202

This space may not have existed until the addition of the east wall separating the stairhall from Bedroom 201 (Figure 2.137). Physical evidence suggests that the east wall may have been added after construction of the Long House, but the exact date is unknown. Split lath remains on all walls and the ceiling. The historic stairhall space has been visually compromised by the 1915 installation of a door to Bathroom 206 and construction of Closet 203-A in 1940.

Analysis of a plaster sample from the east wall of this space revealed the plaster to consist solely of sand and lime with no hair binder.[445] Except for bits of historic plaster found in the ceiling of Room 101, this is the only wall in the house found to date with lime based rather than gypsum based plaster. While lime based plasters are considered a twentieth century material in the context of this house, plaster finishes in Stairhall 202 were also applied during the twentieth century as the keys appear fresh and sound. The existing plaster finishes are in good condition.

The raised floor installed by the Wenzlicks has interesting implications at Stair S-1. The top riser of this stair had been modified to accommodate the higher floor level. The floor nosing board at the edge of the stairwell was raised together with the new floor level as evidenced by the cutting and patching of the board at the stair railing. During attic inspection work the cavity between the old and new floors could be seen the entire length of the hall. The old floor appears to be in good condition although slightly deflected toward mid-span. The bases of the newel post and the first riser board of Stair S-2 were seen to be in good condition. Some of the baseboards may have been salvaged from elsewhere in the house as suggested by the mix in color chronologies.

Stairwell 202-A

Although attic Stair S-2 is original to construction of the Long House, the existing wall framing and finishes above the attic floor level were installed during the twentieth century probably by Albert Wenzlick.[446] There is no physical nor documentary evidence that an enclosure or attic floor hatch existed prior to installation of the existing walls. These walls are framed with salvaged dimensioned lumber and finished with gypsum wall board.

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[445] Arbogast, *Mortar Analysis*, 9. Sample PL-202E-14.

[446] Bill Wenzlick to the author, 7 April, 1992. Wenzlick could not recall this space being any different than now exists.

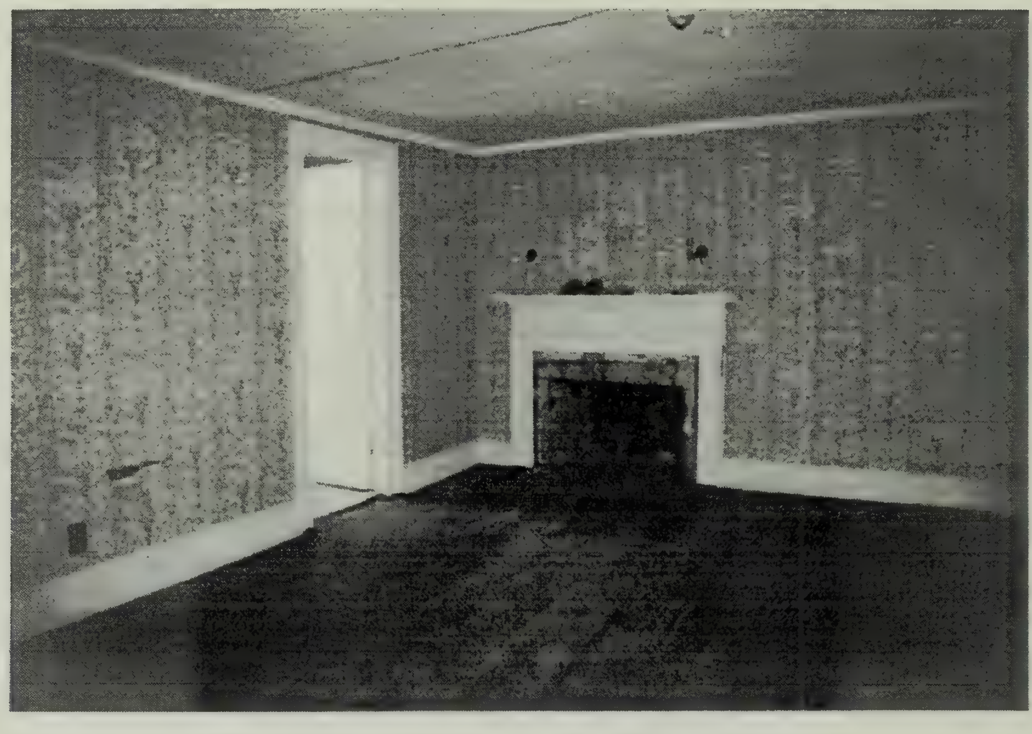

Figure 2.135 - Bedroom 201 toward the northeast, 1994. (Photograph by the author, ULSG collections).

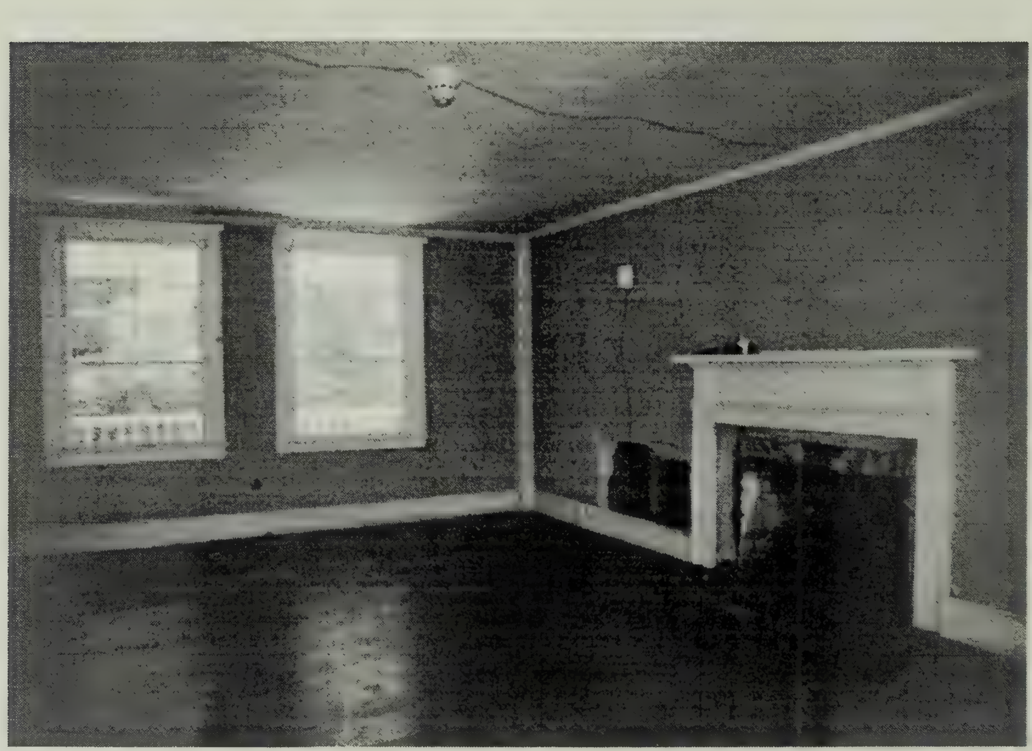

Figure 2.136 - Bedroom 203 toward the southwest, 1994. (Photograph by the author, ULSG collections).

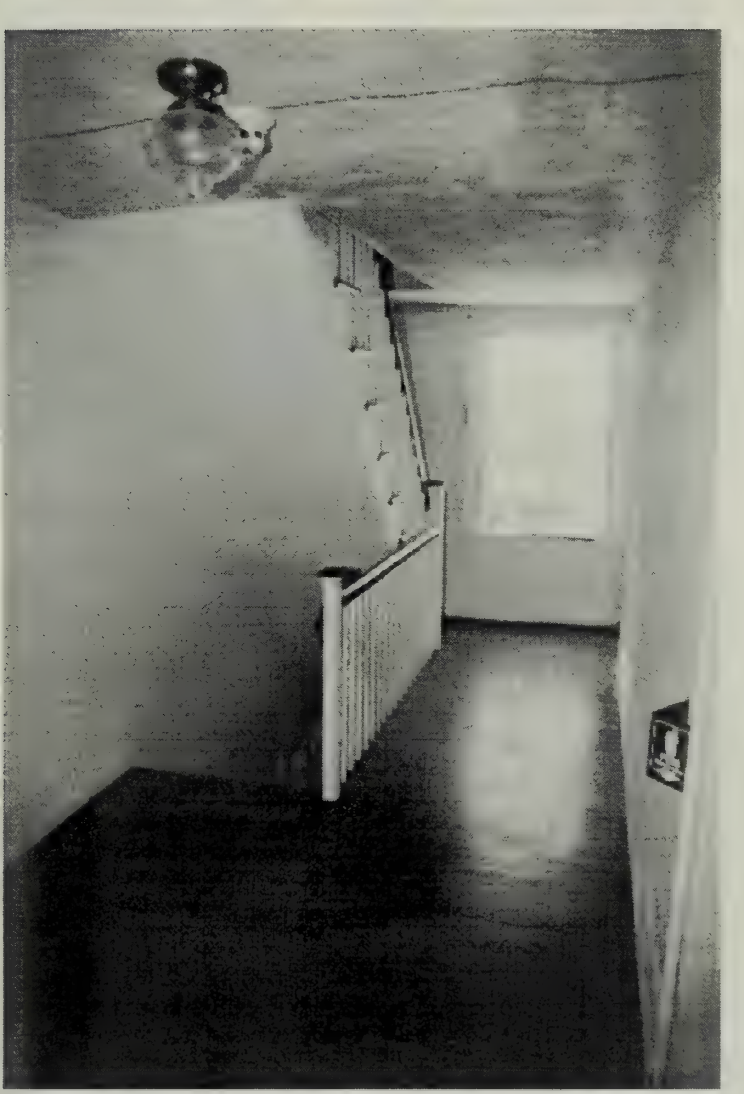

Figure 2.137 - Stairhall 202 looking north, 1994. (Photograph by the author, ULSG collections).

Bedroom 203

This room remains virtually unchanged in function as a bedroom and in size from its original construction (Figure 2.136).[447] The adding of a closet in 1940, a non-historic door and furring to accommodate ducts at the east wall, and the raising the floor are the only visually compromising elements in this room.

All of the original wall finishes have been replaced by wire lath and plaster by the Wenzlicks. Original split lath remains on the ceiling however. The existing finishes are in good condition except for a large hole punched into the west wall during St. Louis County ownership to explore the West Wing attic.

Paint analysis reveals that baseboards and post casings are of high nineteenth century integrity. The integrity of window and door casings and the door are in doubt however as it appears that these pieces of millwork may have been stripped of paint or totally replaced.

Closet 203-A

This closet was added by the Wenzlicks as evidenced by its absence in the 1940 HABS drawings. Therefore it has no nineteenth century integrity. The historic baseboards have been replaced.

Bathroom 206
Bathroom 207

These rooms were created when a single bathroom installed by Albert Wenzlick around 1915 was split into two bathrooms by Delbert Wenzlick around 1940.[448] All wall finishes are of ceramic tile over a plaster and metal lath system. The ceilings are of original split lath and plaster.

Most of the original Long House floors of each of these spaces exist beneath ceramic tile laid over a heavy grout bed. Examination of the underside of the original floor at the living room ceiling revealed that much of the original floor was removed or damaged when plumbing fixtures, pipes, and mechanical ducts were installed. None of the original baseboards remain. The northeast corner post is concealed beneath a furred plaster wall but a small portion of the base of that post can be seen from the open living room ceiling, verifying that the casing remains intact.

Attic 301

This space has served as storage and sleeping quarters during Wenzlick ownership. Except for the addition of dormers, modification of roof rafters when the dormers were installed, and the addition of the partitioned stairwell enclosure, the attic remains virtually as it appeared when it was initially constructed (Figures 2.138 and 2.139). The framing system is open, therefore no finishes have ever have been placed against the end walls or the rafters. Thin, randomly-dimensioned sticks placed

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[447] Bill Wenzlick to the author, 16 April, 1992. This room was his grandfather Albert's bedroom.

[448] Bill Wenzlick to the author, 19 December, 1991.

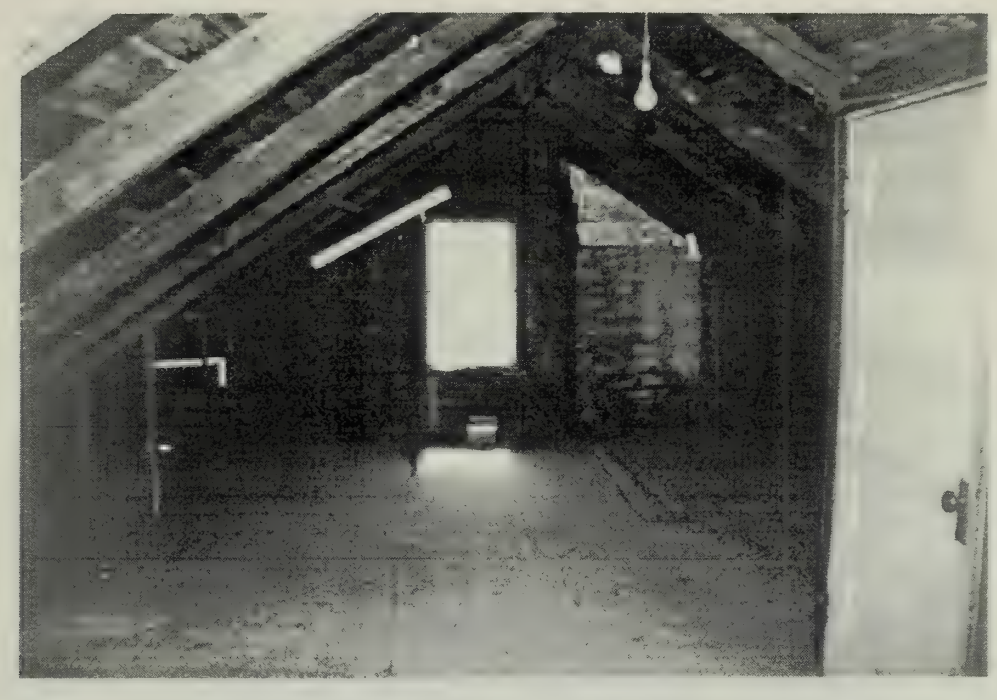

Figure 2.138 - Attic space 301 toward the west, 1994. (Photograph by the author, ULSG collections).

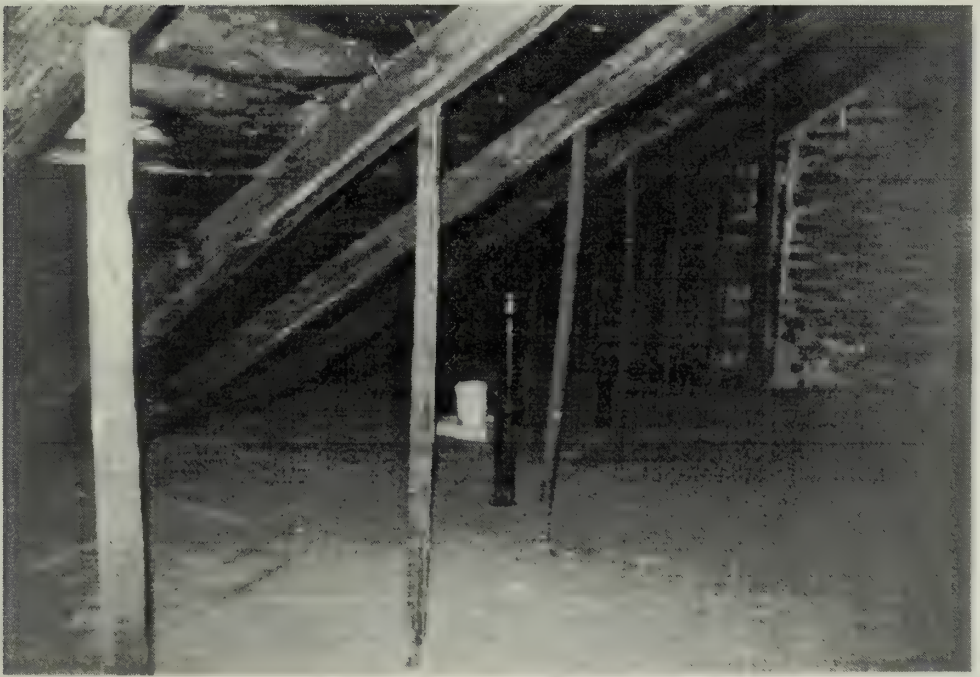

Figure 2.139 - Attic space 301 toward the northeast corner, 1994. (Photograph by the author, ULSG collections).

between the floor and the rafters are probably original to the construction of the roof and are structurally important in the support of roof loads (See Structural Analysis).

The floor is constructed of original tongue and groove random-width yellow pine boards similar to floor systems throughout the remainder of the two story portion of the house. In this case the entire original floor is exposed to view, revealing the surface to be in generally good condition. The floor has been penetrated by two ducts terminating into the attic and a bathroom fan and plumbing vent pipe.

Stairs

Physical evidence suggests that the stair case between the first and second floors, Stair S-1, was completely boxed-in at the first floor level when the Long House was initially constructed. The stair remained in that configuration until around 1840 when the Dents created the first floor Hall 102 and opened the east wall of the Stairwell 102-A and added a balustrade (Figure 2.140). A blunt pointed screw fastens the Stair S-1 rail to the second floor newel post suggesting that the stair was installed prior to 1841. There exists a double vertical paint line at the post casing at the north wall of the first floor hall which indicates the former existence of a narrow partition which enclosed the staircase. It is unknown if the enclosure was finished with wood panels as is the case at the Thomas Sappington house or if the walls were merely plastered.

The stair case between the second and attic floors, Stair S-2, and the second floor railing are probably original to the Long House (Figure 2.137). Subtle differences between railing profiles and tool marks on the risers between stairs S-1 and S-2 indicate that the two stairs were not constructed at the same time. The Stair S-1 rail is ploughed (grooved) at the underside to receive balusters while Stair S-1 rails are flush. The Stair S-2 risers were hand-planed while no such tool marks exist on the S-1 risers.

Simple rectangular newel posts topped with shallow pyramidal caps terminate the Stair S-2 railings (Figure 2.141). These are almost identical to newel posts found on the Thomas Sappington house. The newel post at the base of Stair S-1 is the only piece of turned work found in the house and is in agreement with Greek Revival style of millwork.

All stair components are believed to be constructed of oak. The existing dark red surface coat was painted on risers, treads, and handrails during Delbert Wenzlick's occupation. Paint analysis indicates that Stair S-1 components were finished in the following colors:

Tread edge nosing and newel post: varnish, medium grey, dark green, and several coats of cream
Box stringer: cream, grey, dark green, and several cream coats
Balusters: dark beige, varnish, grey, dark green, and several cream coats

Paint chronologies for Stair S-2 components are as follows:

Railings, treads, and risers: light to medium grey, varnish, red/brown, red

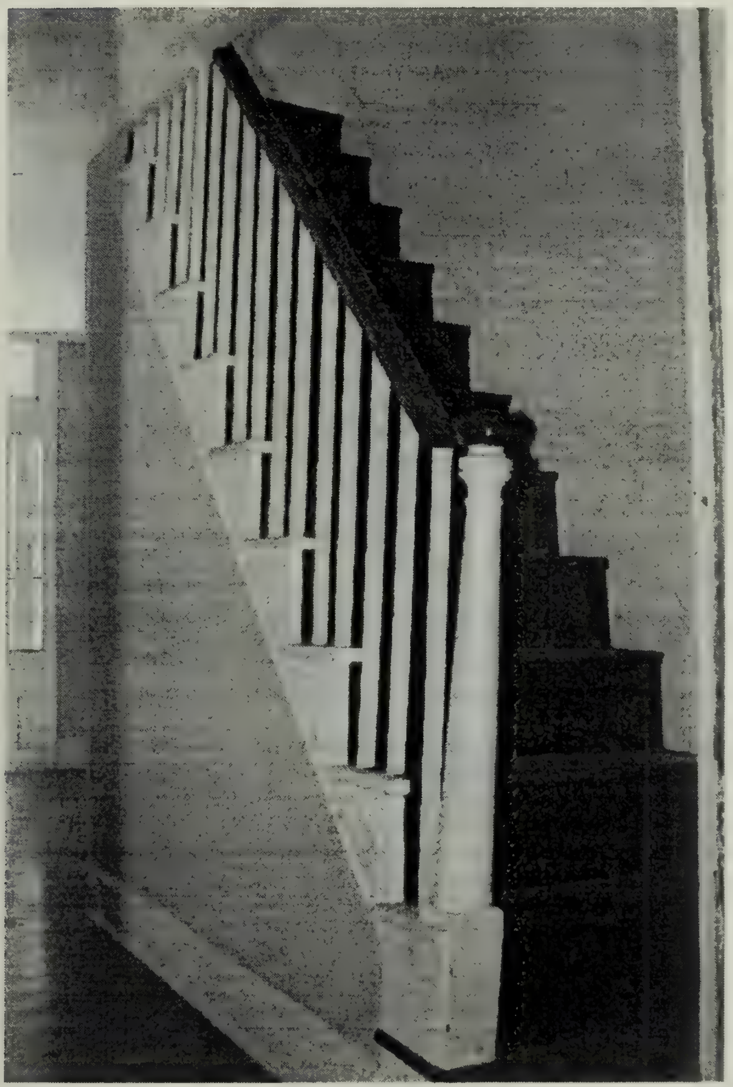

Figure 2.140 - Stair S-1 toward the south, 1994. The Greek Revival newel post is believed to have been installed during the 1830s when the stairwell was modified by the Dent family. (Photograph by the author, ULSG collections).

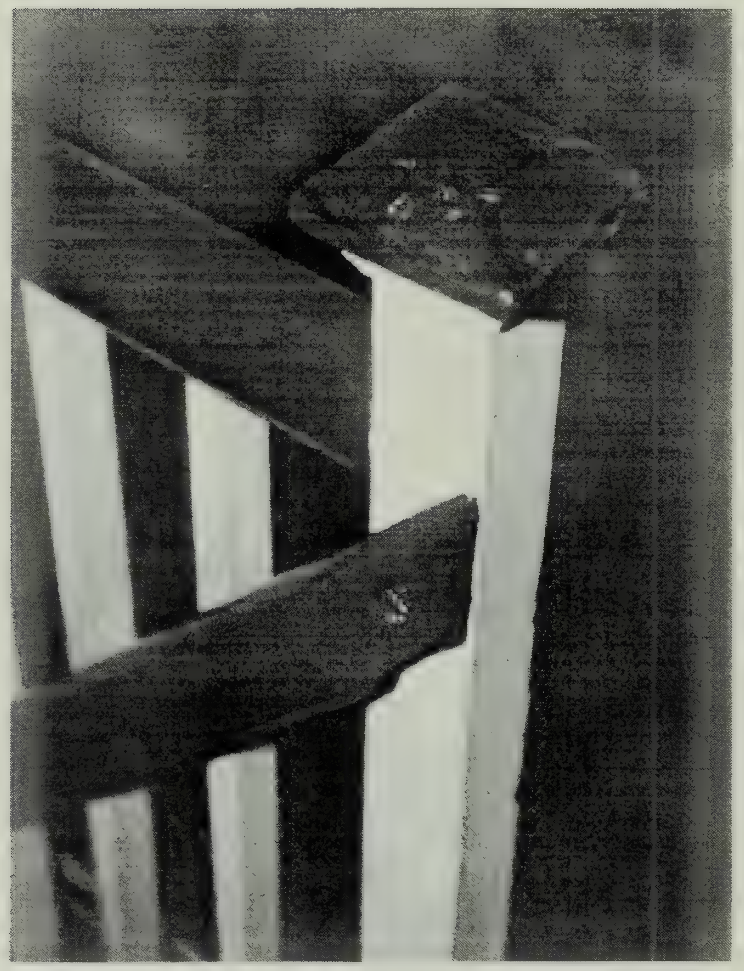

Figure 2.141 - Newel post at the second floor level of Stair S-1, 1994. This newel post is believed to have been installed in 1818. The screw fastening handrail to the post has a blunt point. (Photograph by the author, ULSG collections).

Newel posts and balusters: beige, medium grey, cream (4 layers), off white
East stringer: cream, light to medium grey, cream (3 layer), off white
West stringer: cream, grey, rosy brown, cream (3 layers), off white

During structural documentation, the 7 inch square attic floor joist at the west edge of the stairwell was found to be notched back by 4 inches back from its east face to accommodate the stairwell (See Structural Drawings). This work was probably carried out during the original construction of the house

Stair S-3 (first floor to basement) was installed during the 1940 Wenzlick renovation work. The stair is not documented in the 1940 HABS drawings. The space beneath Stair S-1 (first to second floor) was used as a closet prior to construction of the basement stair.[412] An empty joist mortise pocket in the north foundation sill reveals that the floor system was indeed intact at one time; the joist was removed to accommodate installation of the Stair S-3.

All of the stairs feel solid and are in good condition, although building settlement has forced Stair S-1 treads out of level. Some of the tread nosings, especially at S-1, are fraying due to long-term, everyday use. All railings and newel posts are sound and solidly placed.

All of the stairs are steep and do not conform to present day accessibility standards for uniform risers, tread width, or handrails.[413] However, it is strongly recommended that historic stairs S-1 and S-2 be preserved as each is a primary focal element on each of the two floors (See Treatment Recommendations, Accessibility).

Mechanical and Electrical Systems

Plumbing

The site was serviced by the usual nineteenth century rural water supply systems. An existing brick-lined cistern just north of HABS Room 4 may have been constructed sometime during the second half of the nineteenth century. The cistern can be seen in early Wenzlick photographs (Figures 2.13 and 2.22). The cistern had a chain pump prior to the 1940 renovation work, but this cannot be seen in any of the Wenzlick photographs (see Division 7, Main House Cistern).[414]

There is no evidence that the house had any internal plumbing systems prior to Wenzlick ownership in 1913. After that year Albert Wenzlick constructed a bathroom at the second floor which absorbed a portion of Bedroom 201. There was also some plumbing in the 1940 HABS Room 4 during the early Wenzlick occupation when it served as a kitchen.[415]

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[412] Bill Wenzlick to the author 16 April, 1992, and James Davis to the author 18 March, 1993.

[413] *Uniform Federal Accessibility Standards* (Washington D.C.: Architectural and Transportation Barriers Compliance Board, 1985), 27-29.

[414] Bill Wenzlick to the author, 16 April, 1992. The chain pump was present prior to his entering the service in 1940, but the pump was missing when he got back in 1945.

During early Wenzlick ownership, water was supplied to the house via a brick-lined well located near the former location of the existing barn. Water was pumped from the well to a holding tank located near the existing east fence line and directed to the house for use.[416] The well was apparently dug to supply water to the Grant-ordered barn which was constructed in 1868 (see Division 7, Well).

The house was placed on public water service during the 1920s.[417] The existing galvanized steel pipes are connected to a service line at Grant Road and pass beneath the barn on the route to the Main House and Cottage. The site water service is not metered. The site supply pipes are in very poor condition and almost totally plugged with calcium deposits.[418]

Two septic tanks were constructed by caretaker Charlie Davis around 1914, one for each of the Main House and Cottage. The Main House septic tank is believed to be located about 60 feet west of the Ice House and north of the driveway although it has not yet been located.[419] The other tank is located about 70 feet north of the Cottage. During the 1950s, 4 inch diameter vitrified clay pipe was installed on the site by the Wenzlicks, connecting the Main House and Cottage to a St. Louis Metropolitan Sewer District trunk line. The trunk line is laid on a easement at the west property line. Ground subsidence along the sewer line route indicates that the pipe has cracked or the joints have opened, allowing surrounding soil to erode into the pipes.

The house currently contains an extensive plumbing system installed during 1940 renovation work by Delbert Wenzlick. He installed plumbing at the new kitchen addition, five bathrooms, and miscellaneous hose bibs and feeder lines to the workshop.

The existing plumbing systems have exceeded their serviceable life. In some instances their presence has had a detrimental effect on the historic and structural integrity of the house. Much of the plumbing system is also inaccessible, having been concealed behind plaster finishes, crawlspaces, and buried in concrete foundation walls. Many of the pipes are plugged and the fittings

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415. Bill Wenzlick to the author, 16 April, 1992. A kitchen sink sat against the south wall of what is now Dressing Room 106.

416. Bill Wenzlick to the author 16 April, 1992, and James Davis to the author 18 March, 1993. According to Wenzlick the holding tank measured about 8 feet in diameter by 4 feet deep. This size is confirmed in early Wenzlick movies taken of the tank. Davis indicated that the tank held about 1,000 gallons and supplied only the Main House with water.

417. Bill Wenzlick to the author, 16 April, 1992.

418. Sometime during 1991 an underground water service pipe developed a leak just west of the barn. Upon excavation to initiate repairs, two parallel pipes ¾ inches and 1¼ inches in diameter were found running adjacent to and parallel with each other. It is assumed that the ¾ inch pipe handles the Main House and the 1¼ inch pipe the Cottage water supply system. These pipes were assessed to be in poor condition and are almost totally plugged with calcium deposits. St. Louis County repaired a leak in the Main House line in 1987 about 30 feet south of the house. William Bodley Lane, "Interim Report, White Haven Preservation Plan," (25 September, 1987), 1.

419. James Davis to the author, 18 March, 1993. Davis indicated that the Main House tank was very large and constructed of concrete. The septic system used to drain directly into the Prairie Spring which resulted in a foul odor. Bill Wenzlick to the author, 17 June, 1993.

and valves are deteriorated. Installation of Bathrooms 206 and 207 plumbing severely damaged some of the second floor structural framing and also required the north wall of Living Room 101 to be furred out to provide chase space.

While there may be some interest with regard to twentieth century fixture design, all fixtures including toilets, bathtubs, and lavatories are unsalvageable for public use. The electric water heater was found to be unusable and was removed in 1993. Water flow tests were performed at Grant Road and White Haven Drive in January 1993, to determine the capability of the existing service lines to supply sufficient water pressure and quantity for eventual installation of fire suppression systems at the site. While each of the lines were found to be capable of providing the required water flow, the Grant Road line demonstrated the greater pressure and flow of the two alternatives.[420] Therefore, future fire suppression and domestic water should be obtained from the Grant Road water line.

Natural Gas System

Natural gas service was installed to the house in 1970 and is metered at the south fence line along Fernald Drive.[421] Gas is piped to the furnace, kitchen, and Fireplaces FP2 and FP4, although the line to FP4 in Room 101 was tapped from the branch line to the Stone Building just east of the East Chimney stack.

Fuel Oil Storage Tanks

Two underground fuel oil storage tanks were found on the property. One at the northwest corner was installed with the construction of the workshop around 1950 and serviced a furnace in the

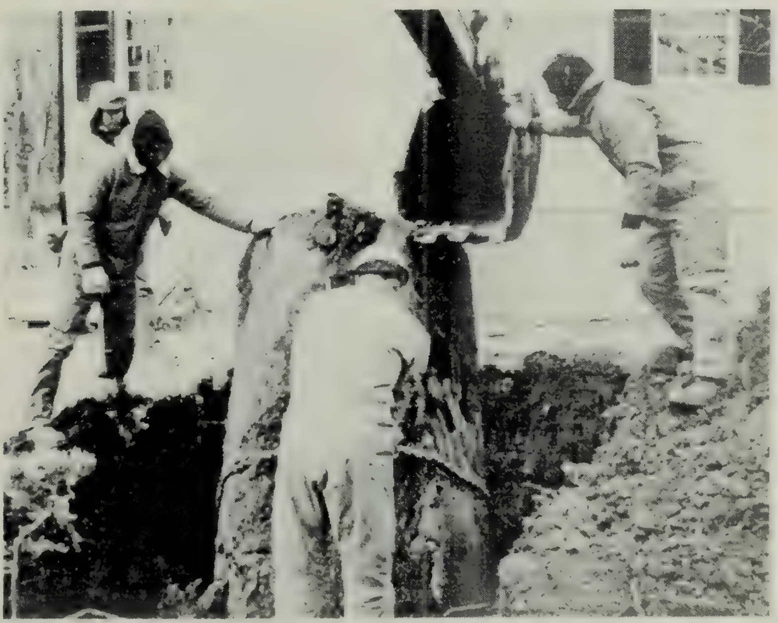

Figure 2.142 - Fuel oil tank removal at west side of the Main House, 1991. (Photograph by the author, ULSG collections).

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[420] Bi-State Fire Protection Corporation to CMLAV, 3 February, 1993, ULSG files.

[421] Bill Wenzlick to the author, 28 October, 1991.

workshop. The other tank, located near the west elevation of the house, was installed around 1914 and serviced the house boiler and early forced-air furnace systems.[422] Neither tank has been in use since installation of natural gas service in 1970. Oil was removed August 13, 1991, from the tanks and open containers stored in the Chicken House. The tanks were removed on December 19, 1991, and the resultant voids backfilled with soil brought in from elsewhere (Figure 2.142). Two copper tubes with remains of fuel oil were found beneath the concrete floor of basement Room 003. It is suspected that the tubes supplied the furnace with fuel from the west oil tank.

Heating and Cooling Systems

Prior to the circa 1914 installation of a hot water radiant heating system in the house, all heating was provided by the seven wood burning fireplaces (See Fireplace Analysis). The boiler was fueled by coke during its first year of operation and then modified to burn fuel oil thereafter.[423] The system boiler was located in the basement somewhere in Room 003, and was probably a low pressure hot water system.[424]

Cast iron radiators for that system were located at the south walls of Rooms 101, 103, 104, 201, and 203.[425] In the 1940 HABS photograph of the east exterior elevation (Figure 2.25), an image of one of these radiators is seen behind the large tree in the foreground. The radiators probably required the drilling of holes through the original wood floor and ceilings to accommodate the distribution of pipes.

The present forced-air heating and cooling system was installed by Delbert Wenzlick during 1940 renovation work. The radiant heating system was removed at the time. Gas fired dual furnaces are located in basement Room 002. The furnaces in place at the time of National Park Service acquisition were installed in October 1970, and were deemed unserviceable. These furnaces were replaced in October 1990 with the intent of drying the moisture-laden interior which had caused mold growth on finish surfaces (Figure 2.128).

Combusted furnace gases were exhausted through a flue installed within the central stone masonry stack. Discovery of severely deteriorated stone lined flues and inappropriate routing of the clay flue liner during a 1991 physical investigation resulted in the decision to operate the furnaces at a low heating level during the heating season to reduce the probability of structural fire (See Chimney

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422. James Davis to the author, 18 March, 1993. Davis indicated that his father, Charles B. Davis, installed the tank around 1913 when the boiler was installed. The boiler operated on coke for about one year prior to the switch to fuel oil.

423. James A. Davis to the author, 13 April, 1993. The coke came from a brick and coal yard owned by Albert Wenzlick.

424. Bill Wenzlick to the author, 24 February, 1992, and James A. Davis to the author, 18 March, 1993. Davis recalled that there was no central heating system in the house prior to Albert Wenzlick's ownership. Both gentlemen recalled that the boiler was located in Room 003; Wenzlick remembering that it may have been south of the central chimney stack but Davis was unsure. According to Wenzlick the system required two hours before the radiators produced heat from the time the system was activated, and therefore it is assumed that the heating system was low pressure water.

425. Bill Wenzlick to the author, 16 April, 1992. Documentation of radiator locations is important to account for vacant holes in the floor boards where pipes had been and perhaps water damage to the original floor surfaces.

Analysis, Central Chimney). The furnaces were completely removed from the masonry stack in 1992. A temporary fan powered metal flue was then installed through a basement window. The flue exhausts from beneath the front porch deck.

Local lore upholds that this was the first air conditioned residential structure in St. Louis County. Air was cooled by an ingenious home-built system installed by Delbert Wenzlick during 1940 renovation work. The system circulated water from the furnace plenum coils to a brick pond located about 150 feet southeast of the house (see Division 7, Fountains). A fountain at the center of the pond cooled the pond water through air evaporation. This system operated until the underground distribution pipes became plugged in 1970. Rather than replace the pipes, Delbert Wenzlick installed condenser coil units just west of the front porch. The cooling pond has remained unused since installation of the condensers.

An extensive system of sheet metal supply and return air ducts was installed throughout the house to service the forced-air system. Since the historic wall cavities did not afford enough space to run ducts, the Wenzlicks furred out the central hall walls at both floors to provide the required chase dimensions. Furring out the walls resulted in the unfortunate removal of original lath and plaster finishes. Installation of duct and register risers also required the cutting of access holes through historic floors and structural framing. The ceiling of the basement Furnace Room 002 is practically concealed by ducts making investigation of material condition very difficult.

Electrical System

All electrical systems are believed to have been installed during the twentieth century. The first system was installed around 1914 by Delbert Wenzlick and site caretaker Charles B. Davis to power

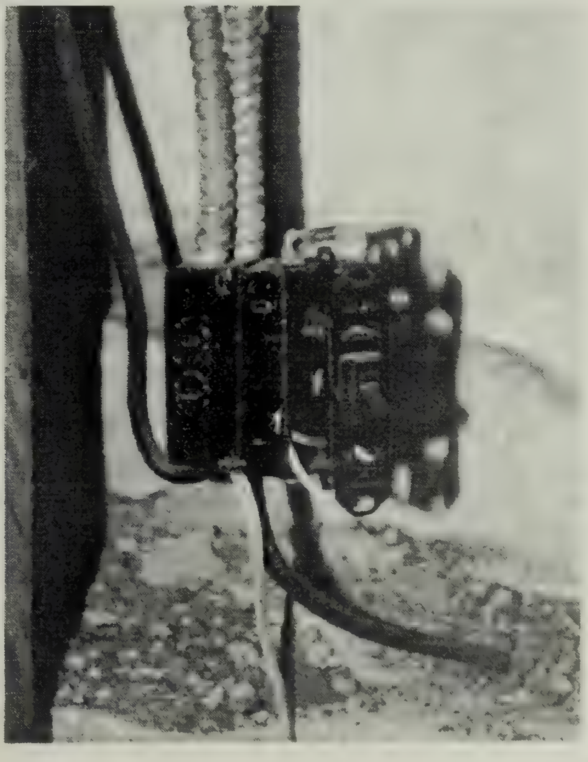

Figure 2.143 - Electrical switch in basement Room 003, 1991. Discovery of overloaded circuits and inappropriate wiring methods led to the immediate disconnection of all electrical service in the house. In this case, armored and asphalt insulated cable, and lamp cord were all fastened to one switch. (Photograph by the author, ULSG collections).

lighting and simple appliances. That knob and tube system was operated by batteries which were charged by a gasoline engine-powered generator located in a now demolished north wing of the Grant barn (see Division 4).[426] Early service lines were believed to have been strung to the underside of the first floor porch ceiling (Figure 2.18). Later, service lines were moved to the southwest corner of the house possibly at the time the property was linked with the Union Electric power grid in the 1920s. Service lines were initially supported by a pole placed at the southwest corner of the house. By 1940 the pole support was replaced with insulators fastened to the house.

The house currently has 100 ampere service through an antiquated fuse box located at the south wall of the Furnace Room 002. There are two electric meters in that same room, one for general service and one to monitor use on the electric water heater.[427] Delbert Wenzlick installed a speaker system throughout the house controlled from a phonographic station constructed at the west wall of Breakfast Room 108. Speakers were located in built-in cabinets in Living Room 101, and the ceiling of Breezeway 110.

The variety of conductors and electrical devices indicates that the electrical system has been added to and modified extensively since 1940. Much of the wiring is jury-rigged and not to code. As a result, most of the electrical system was taken off line in 1991 to prevent the possibility of electrical fire (Figure 2.143). Only the security system, furnace, and one new fourplex receptacle on each floor

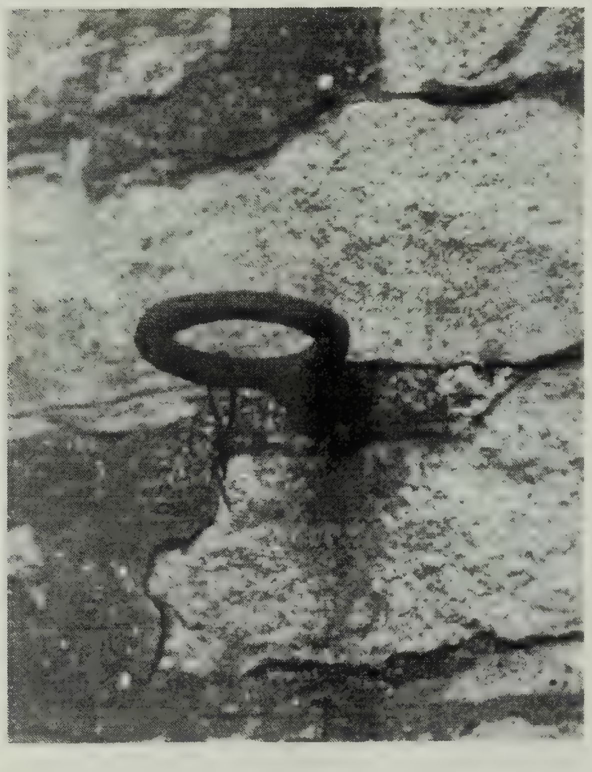

Figure 2.144 - Lightning system down conductor standard, 1994. Five of these hand wrought iron standards exist at the east chimney stack. None are found on the other two chimney stacks. (Photograph by the author, ULSG collections).

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[426] James and Charles A. Davis to the author, 18 March, 1993. The generator charged the batteries to yield about one week of electrical use.

[427] Bill Wenzlick informally to the author. Electric water heaters were at one time monitored on a separate meter with a timer switch so that peak use could by controlled by the electric utility. This was to prevent utility grid brown and black outs during peak use periods.

level are serviced by the system. None of the old electrical devises, conductors, or fixtures are salvageable.

Lightning Protection

There is currently no active lightning protection system on the house, but there is physical evidence that the house had an early protection system. Five hand-wrought iron down conductor standards are mortared or hammered into the east chimney stack (Figure 2.144). The standards are placed at fairly even intervals in a vertical line at the center of the east face of the stack. During Summer 1991 archeological investigations, there was no evidence to suggest the former placement of a ground rod. The rod may have been removed for salvage or dug out during Wenzlick foundation work. There is no readily apparent physical nor documentary evidence that a lightning protection system was present at the other two chimney stacks or roof.

On August 28, 1991, lightning struck a tree very near the southeast corner of the stone building. The tree split in two, one half falling on the Stone Building roof. This incident builds a strong case for installing a complete lightning protection system on at least the Main House, Stone Building, and Barn.

Security System

No fire or intrusion detection and alarm systems existed on the house prior to August 1990. The National Park Service installed a battery-powered, radio-operated system throughout the house in

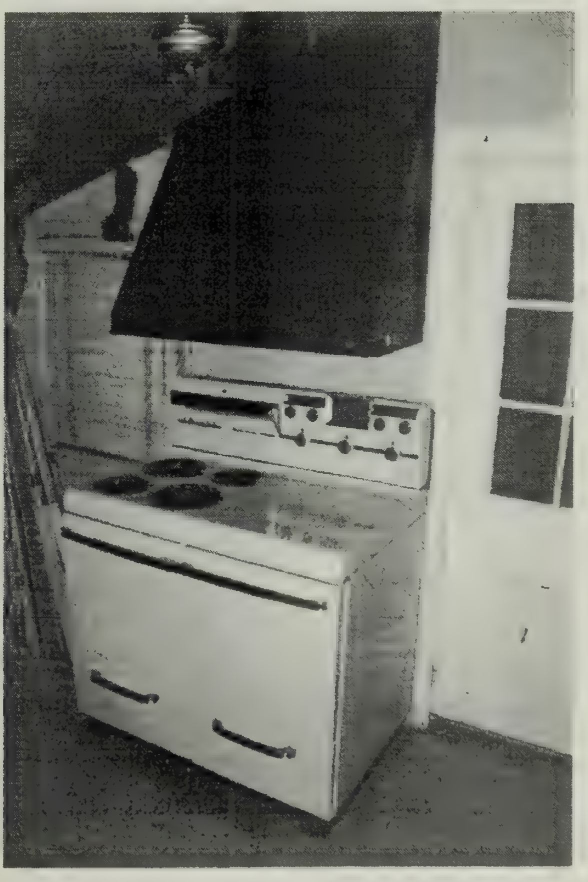

Figure 2.145 - Philco range and hood in Kitchen 109, 1994. (Photograph by the author, ULSG collections).

that month. The intent of installing a radio controlled system was to eliminate the possibility of damaging unresearched historic fabric by running wires through walls and ceilings. That system was disconnected and replaced with a temporary, hard-wired system in 1993.

Communication System

Telephone service to the Main House and Cottage is believed to have been installed by the early 1920s.[428] The system inherited by the National Park Service was abandoned and new underground cable installed to service the security systems and a single telephone in the workshop. The house is saturated with telephone jacks and surface-mounted conductor, installed by the Wenzlicks.

There is a simple intercom system between the Bedroom 104 and the basement Bedroom 004 which consists of one hand-held transmitter/receiver in each room. The Wenzlicks installed this when domestic laborers lived in the basement apartment. The intercom was powered by a jury-rigged tube of D-cell batteries hidden on top of the Room 003 foundation wall.

Miscellaneous Equipment

Upon acquisition of the property, the National Park Service inherited an electric stove (Figure 2.145), dish washer, ceiling and ventilation fans, and cooling coils from a very early refrigerator. Although the stove and coils may be of some contemporary cultural interest, none of the equipment has any nineteenth century integrity.

ACCESSIBILITY EVALUATION

In its present condition the Main House is not accessible to wheelchairs. It is necessary to identify accessibility barriers so that corrective action can be taken based upon proposed treatment recommendations and interpretive routes. Standards for the following evaluation are derived from *Uniform Federal Accessibility Standards*, 1985. Parenthetical references are made for specific standards.

The approach to the front, or south side, of the house is along a flagstone walk from the asphalt drive (Figure 7.1). The rise from the drive to the front steps is approximately 54 inches and the run 60 feet. This slope is barely within the maximum established standard of 1 inch for every 1 foot of run (4.8.2), and would require handrails to either side. However, standards require a landing after 30 inches of ramp rise. Substantial regrading of the approach to the house would be required to attain a 1:20 slope without handrails. The existing walkway pavement consists of broken and heaved flagstone which is a barrier to efficient wheelchair movement. There is no ramp access to the porch nor from the porch into the house. The two stone steps at the front porch have non-uniform risers with no handrails.

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[428] Bill Wenzlick to the author, 16 April, 1992. Wenzlick could always remember a phone on the site when he was a boy in the 1920s. He recalled the telephone number at that time being DIXON 4158.

Figure 2.146 - Stone steps leading to the front porch, 1994. (Photograph by the author, ULSG collections).

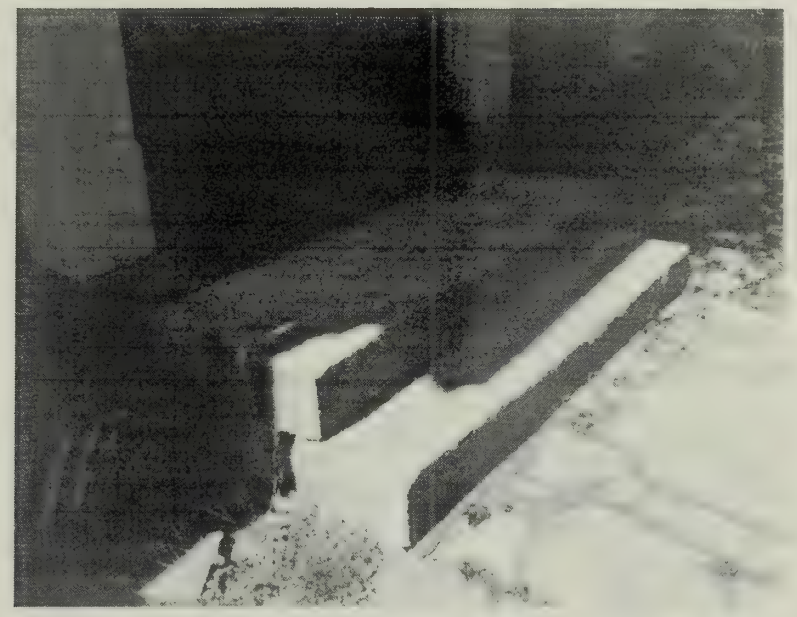
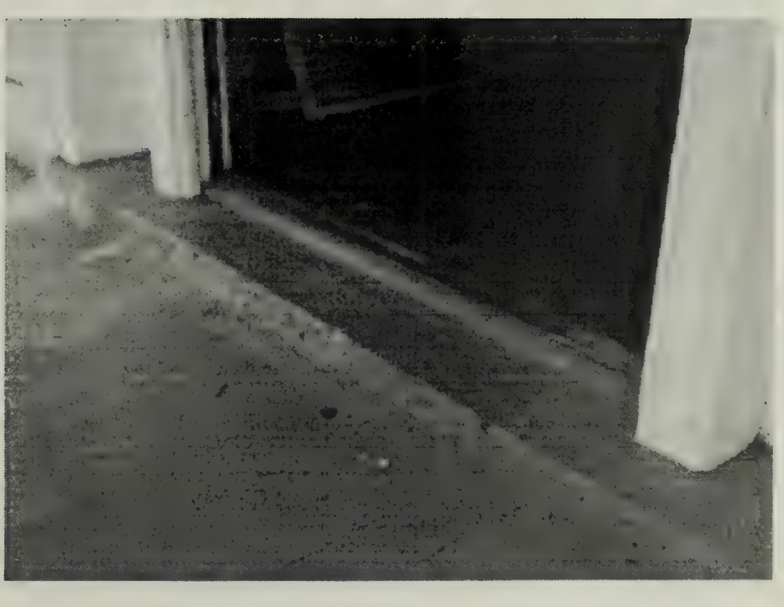


Figure 2.147 - Rise at front door sill, 1994. The sill and threshold are barriers to wheelchairs at the front entry. (Photograph by the author, ULSG collections).



The first floor is not accessible to wheelchairs at present. There are no ramps to the front porch and breezeway areas (Figure 2.146). There are also no ramps at entry door thresholds (Figure 1.147).

The second floor is not accessible to wheelchairs at present. Stairs S-1 and S-2 do not conform to current accessibility standards and are very steep and difficult to climb for the uninitiated (Figure2.148). The risers are 9 inches high and the treads 8 inches wide which grossly conflicts with the 7 inch riser and 11 inch tread standard (4.9.2). The stairs do not conform to standards for handrails including the requirement for two handrails, handrail extension beyond ends of the stairs, clearance between wall and rail, and unobstructed run (4.9.4). Stair S-3 and the exterior cellar stairs to the basement level are similarly non-conforming to the standards. A level change of 8 inches at the first floor occurs between the Long House and the West Wing. This is the primary circulation route to the only restroom at the first floor.

Doorways at all principal spaces are accessible at the first and second floors in conformance with minimum 32 inches clear opening width (4.13.5). However, first floor Bathroom 107 and second floor Bathrooms 206 and 207 are inaccessible. The finish opening at the cellar step-down door (003-D1) is over 4 inches shy of the minimum width requirement.

It must be mentioned that removal of the existing floor surface to expose the historic floor finishes could make interior accessibility more challenging. The Wenzlicks laid the over-floors to provide a uniform, level surface throughout the house. Removal of the existing surface may expose uneven floor boards, patches, and depressions. A photograph taken prior to top floor construction shows that there is a slight step down into Hall 102 from the front door at the original floor level (Figure 2.32).

CODE EVALUATION

This evaluation employs the following references:

> UBC - *Uniform Building Code*. Whittier, California: International Conference of Building Officials, 1985.
>
> UCBC - *Uniform Code For Building Conservation*. Whittier, California: International Conference of Building Officials, 1987.
>
> Heideman + Associates, Inc. *Utilities, Mechanical and Electrical Treatment Recommendations and Building Code Review, Main House and Stone Building, Ulysses S. Grant National Historic Site, St. Louis, Missouri*. June 1, 1994.

Classification

The Heideman report references "The BOCA National Building Code 1990 (BOCA/1990)" which is adopted by St. Louis County. In summary, the Main House is classified as Group A-3 structure "...in which persons assemble for amusement, entertainment or recreation purposes as well as incidental motion picture, dramatic or theatrical presentations, lectures or other similar purposes without theatrical stage other than a raised platform; and which are principally used without permanent seating facilities, including art galleries, exhibition halls, museums, lecture halls, libraries..." Because of this classification, the house is required to carry a Type 3B Classification of Building Construction which "...shall include all buildings of Type 3 construction in which the interior structural members are constructed of wood not less than 2 inches nominal in thickness or consist of combustible or non-combustible materials protected with less than a 1-hour fire resistant rating."[429]

Allowable Floor Areas

The following table lists the net floor areas for occupiable spaces within the existing Main House.

Present occupiable area is as follows:	Area (sq ft)
Basement	
West Wing winter kitchen (003)	219
Remainder (mechanical space)	567
Total Basement	786
First Floor (101, 102, 103, 104, 106, 107, 108, 109)	1,326
Second Floor	652

Potential occupiable area after treatment is as follows:	Area (sq ft)
Basement	
West Wing winter kitchen (003)	219
Remainder (mechanical space)	807
Total Basement	1,026
First Floor	
Main Floor (101, 102, 103, 104,)	884
HABS Room 4	130
Hunt Addition	232
East Wing	105
Total First Floor	1,351
Second Floor Total	652

Area Separations

There are no requirements for fire resistive separation for structures of mixed occupancy, A-3 and B-2 (Table No. 5-B).

Toilets

Due to the historically sensitive nature of this structure, public toilets may have to be located elsewhere on the site. However every effort should be made to design a unisex restroom for park staff and visitors that meets accessibility standards.

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[429] HA, *MEP*, 13.

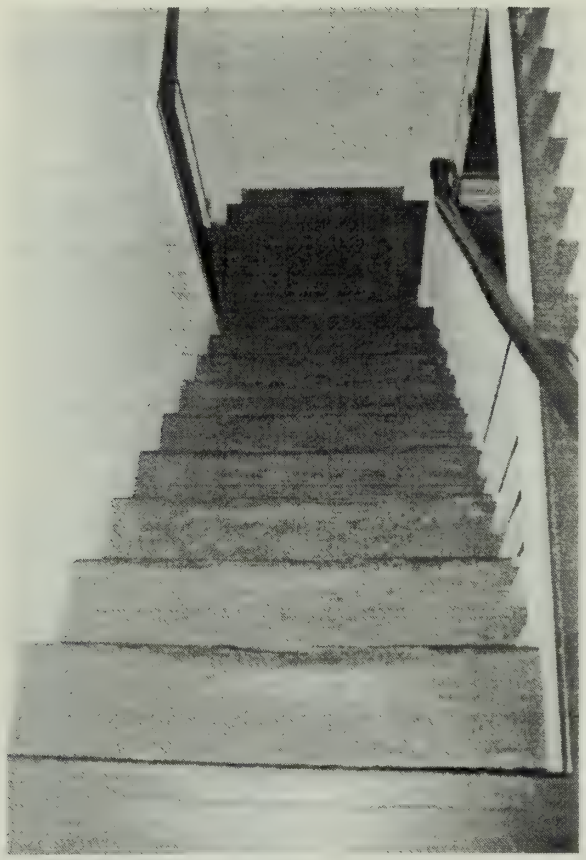

Figure 2.148 - Stair S-1 from the second floor level, 1994. The steep slope, variable risers, and absence of adequate handrails make this stair a challenge to ascend for the uninitiated. (Photograph by the author, ULSG collections).

Fire Ratings of Systems

An approved automatic sprinkler system may substitute for one-hour fire-resistive construction (UBC 508). However, a sprinkler system cannot be used to substitute for, or act as an alternate to, the required number of exits from any facility (UCBC 605(a)).

Required Exits and Stairways

Basement areas used for assembly, such as basement Room 003, must have two exits. The cellar door opening must have a clear width of not less than 32 inches and a height of not less than 6 feet 8 inches. (UBC 3304(E)). "The access hatch and stair down do not comply with egress requirements because of the door size and stair landing needed to exit the occupancy load indicated. Public access would only be allowed by variance through local plan reviewing and the board of appeals."[430] Service and mechanical areas need have one exit (UBC 3303(a)).

The principal first floor area consisting of Rooms 101, 102, 103, 104, 106, and 107, is considered a place of assembly and must have a minimum of two exits. However, the two exits 102-D1 and 102-D2 are not sufficiently separated to provide required egress, especially if West Wing Room 104 is occupied. A sprinkler system cannot be used to substitute for, or act as an alternate to, the required number of exits from any facility (UCBC 605(a)). Therefore, if the house is to be restored an alternate exit must be provided through West Wing Door 104-D3. If the HABS Room 4 is reconstructed, the egress path must pass through and out the north door of that room. The code allows for exits through adjoining rooms provided that the route is direct, obvious and unobstructed to an exit (UBC 3303(b)).

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[430] HA, *MEP*, 15.

Doors must swing in the direction of egress for occupancies of 50 or greater (UBC 3304(a)). The first floor (preserved or restored) has a rated occupant load of about 90 persons. None of the existing doors open in the direction of egress and to modify them to do so would compromise the historic appearance of the structure.

Within a building, changes in elevation of less than 12 inches along any exit serving an occupant load of 10 or more shall be by ramps (UBC 3301(d)). This condition presently occurs at Door 103-D3. If the house is restored, this condition would occur at Door 104-D3 where the West Wing was about 9 inches above HABS Room 4. A ramp may be required into Room 104 if that space is to be accessed.

The Hunt Addition and East Wing are single rooms with one exit each. Each is small enough that a single exit is sufficient. According to the UBC, the second floor shall be provided with not less than two exits (UBC 3303(a)). At present, the second floor has one means of egress, Stair S-1, that does not meet codes for width (34 inches), handrails, landing size, rise and run limitations, and uniformity of rise (UBC 3306).[431]

Stair Enclosure
None of the existing interior stairs is enclosed as required (UBC 3309) (Figure 2.148).

Exit Illumination
It will be necessary to install exit illumination and emergency lighting (UBC 3313). None now exists.

Exit Signs
Signs are required when the occupancy load is 50 or more (UBC 3314(a)).

Panic Hardware
Panic hardware may be omitted from the main exit when the main exit consists of a single door. A key-locking device may be used in place of the panic hardware, provided there is a readily visible durable sign adjacent to the doorway stating "THIS DOOR MUST REMAIN UNLOCKED DURING BUSINESS HOURS" (UBC 3318(a)). For the Main House the front door shall be considered the main exit. The sign might be omitted if park personnel are rigidly instructed in the egress requirements and the doors are under supervision when the public is present.

---

[431] HA, *MEP*, 15. "...the stairway exits are inadequate."

EXISTING CONDITIONS DRAWINGS

The following set of drawings were produced from 1991 until 1994 to supplement HABS drawings completed in 1991. All of these drawings are available on AutoCAD. HABS floor plans and exterior elevations were scanned, digitized to AutoCAD, and revised for this set of drawings. Interior elevation drawings were initially hand drawn in ink on mylar sheets, then scanned and digitized for AutoCAD use in 1992. All field notes, original interior elevation drawings, and AutoCAD disks are in the park collections.

MAIN HOUSE (HS-1)
EXISTING CONDITIONS DRAWINGS
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS COUNTY, MISSOURI

LIST OF DRAWINGS

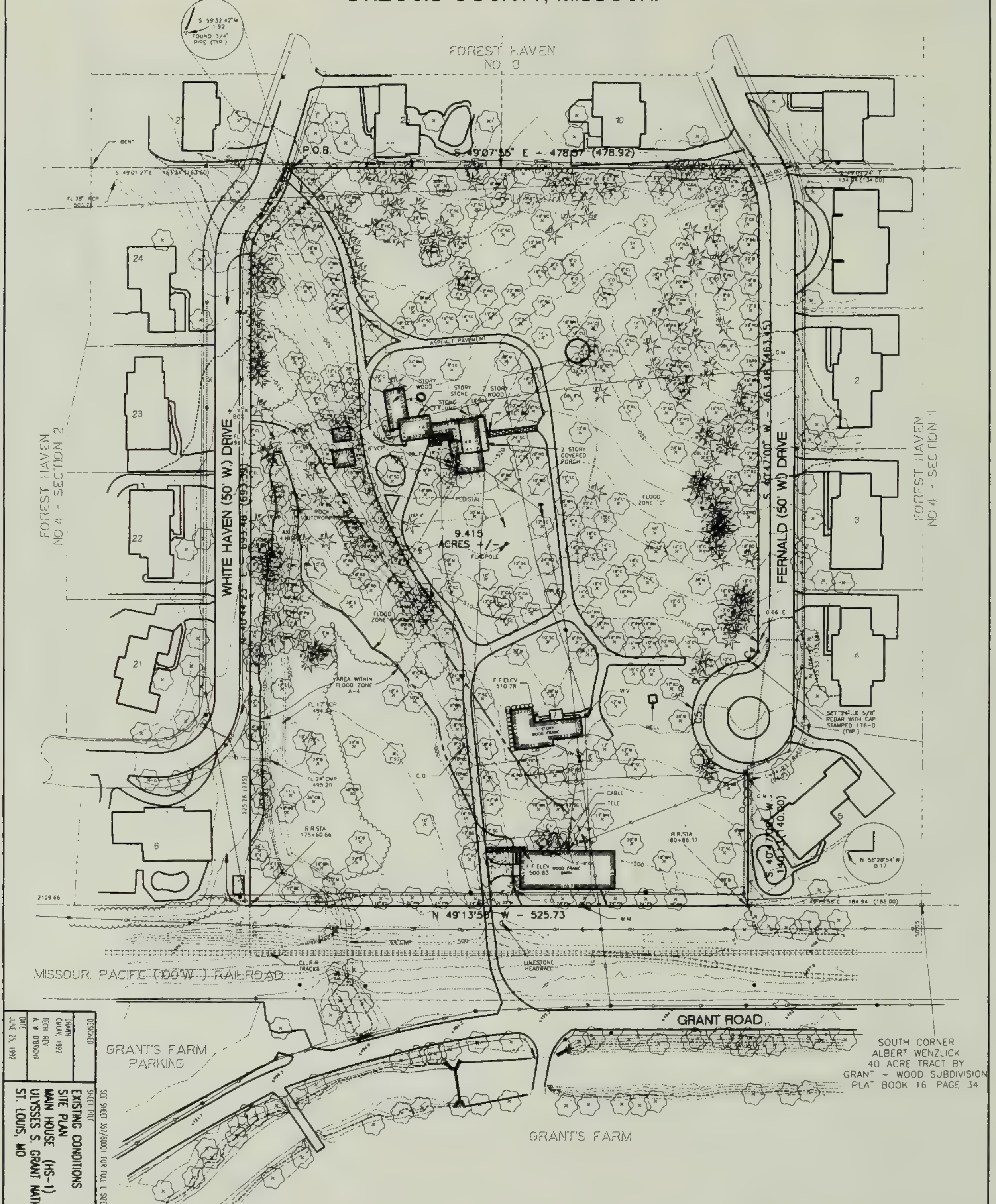
1. TITLE SHEET
2. SITE PLAN
3. BASEMENT FLOOR PLAN
4. FIRST FLOOR PLAN
5. SECOND FLOOR PLAN
6. ATTIC FLOOR PLAN
7. ROOF PLAN
8. BASEMENT REFLECTED CEILING PLAN
9. FIRST FLOOR REFLECTED CEILING PLAN
10. SECOND FLOOR REFLECTED CEILING PLAN
11. ATTIC REFLECTED CEILING PLAN
12. BUILDING SECTIONS
13. FRONT PORCH/ LONG HOUSE WALL SECTION
14. WEST WING BUILDING SECTION
15. EAST CHIMNEY STACK SECTIONS & ELEVATIONS
16. SOUTH EXTERIOR ELEVATION
17. WEST EXTERIOR ELEVATION
18. NORTH EXTERIOR ELEVATION
19. EAST EXTERIOR ELEVATION
20. INTERIOR ELEVATIONS, ROOMS 001-002C
21. INTERIOR ELEVATIONS, ROOMS 002B-005
22. INTERIOR ELEVATIONS, ROOMS 005-102
23. INTERIOR ELEVATIONS, ROOMS 102-104
24. INTERIOR ELEVATIONS, ROOMS 104-107A
25. INTERIOR ELEVATIONS, ROOMS 108/109-201
26. INTERIOR ELEVATIONS, ROOMS 201A-203A
27. INTERIOR ELEVATIONS, ROOMS 206-301
28. INTERIOR ELEVATIONS, ROOM 002A & 202A
29. FIRST FLOOR STRUCTURAL FRAMING PLAN
30. SECOND FLOOR STRUCTURAL FRAMING PLAN
31. ATTIC FLOOR STRUCTURAL FRAMING PLAN
32. RAFTER FRAMING PLAN
33. FIRST FLOOR STUD PLAN
34. SECOND FLOOR STUD PLAN
35. WINDOW SCHEDULE AND ELEVATIONS
36. WINDOW DETAILS
37. WINDOW DETAILS
38. DOOR SCHEDULE
39. DOOR ELEVATIONS
40. FRONT DOOR (102-D1) ELEVATIONS AND DETAILS
41. DOOR DETAILS
42. DOOR DETAILS
43. ROOM FINISH SCHEDULE

SYMBOLS KEY

☒	CEILING MOUNTED LIGHT FIXTURE
●	HARDWIRED SMOKE DETECTOR

CONCURRED ASSOCIATE REGIONAL DIRECTOR DATE	RECOMMENDED SUPERINTENDENT DATE	DESIGNED	SHEET TITLE EXISTING CONDITIONS TITLE SHEET MAIN HOUSE (HS-1) ULYSSES S GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXTITL	DRAWING NO 357/80002
APPROVED REGIONAL DIRECTOR DATE	CHIEF, CULTURAL RESOURCES MANAGEMENT DATE	DRAWN K R MAHOLF L M JOHNSON TECH REV A W D BRIGHT DATE JUNE 25 1992		SUB SHEET	SHEET 1 OF 43

ULYSSES S. GRANT NATIONAL HISTORIC SITE
U.S.SURVEY NO. 9, FRACTIONAL SECTION 16, TOWNSHIP 44 NORTH, RANGE 6 EAST, ST.LOUIS COUNTY, MISSOURI


S 59°32'42"W
1.92
FOUND 3/4" PIPE (TYP.)
FOREST HAVEN NO. 3
P.O.B.
S 49°07'55" E - 478.07' (478.92)
S 49°01'27"E
BENT
WHITE HAVEN (50' W.) DRIVE
FERNALD (50' W.) DRIVE
S 40°47'00" W - 463.45' (463.35)
FOREST HAVEN NO. 4 - SECTION 2
FOREST HAVEN NO. 4 - SECTION 1
ASPHALT PAVEMENT
STORY WOOD
1 STORY STONE
2 STORY WOOD
STONE
2 STORY COVERED PORCH
PEDISTAL
9.415 ACRES +/-
FLAGPOLE
ROCK OUTCROPPING
FLOOD ZONE
AREA WITHIN FLOOD ZONE A-4
F.F. ELEV. 510.78
1 STORY WOOD FRAME
WELL
FL 17" CMP 494.97
FL 24" CMP 495.20
R.R. STA 175+60.66
R.R. STA 180+86.17
CABLE
TELE
F.F. ELEV. 500.83
WOOD FRAME BARN
SET 24" x 5/8" REBAR WITH CAP STAMPED 176-0 (TYP.)
N 56°28'54"W 0.17
N 49°13'58" W - 525.73
184.94 (185.00)
134.94 (134.00)
LIMESTONE HEADWALL
CL R.R. TRACKS
MISSOURI PACIFIC (100'W.) RAILROAD
GRANT ROAD
GRANT'S FARM PARKING
GRANT'S FARM
24
23
22
21
6
10
2
3
4
5

SOUTH CORNER
ALBERT WENZLICK
40 ACRE TRACT BY
GRANT - WOOD SUBDIVISION
PLAT BOOK 16 PAGE 34

DESIGNED	DRAWN CMLAY, 1992 TECH REV A W O'BRECHT	DATE JUNE 25, 1997

SHEET TITLE
EXISTING CONDITIONS
SITE PLAN
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

SEE SHEET 357/80001 FOR FULL E SIZE DRAWING

AUTOCAD FILE: WHEXSP01
SUB SHEET
DRAWING NO: 357/80002
SHEET 2 OF 43

ABBREVIATIONS

FL	DENOTES FLOWLINE
C.O.	DENOTES SEWER CLEANOUT
VCP	DENOTES VITRIFIED CLAY PIPE
CMP	DENOTES CORRAGATED METAL PIPE
RCP	DENOTES REINFORCED CONCRETE PIPE
GM	DENOTES GAS METER
WM	DENOTES WATER METER
WV	DENOTES WATER VALVE

LEGEND

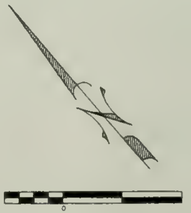
○	MANHOLE	●	ELECTRIC BOX
▫	GRATE INLET	◆	FIRE HYDRANT
○	VENT	D	TRAFFIC SIGNAL
⊗	INLET	▲	YARD HYDRANT
⊞	DOUBLE INLET	●	BOLLARD
⊐	FLARED END SECTION	-○-	SIGN
●	UTILITY POLE	■	MAILBOX
←	CUT WIRE	⌧	LIGHT STANDARD
▲	VALVE		

—— E —— UNDERGROUND ELECTRIC
—— G —— UNDERGROUND GAS
—— T —— UNDERGROUND TELEPHONE
—— W —— UNDERGROUND WATER
—— OH —— OVERHEAD UTILITIES

TREE LEGEND

✶ PINE
C = CEDAR

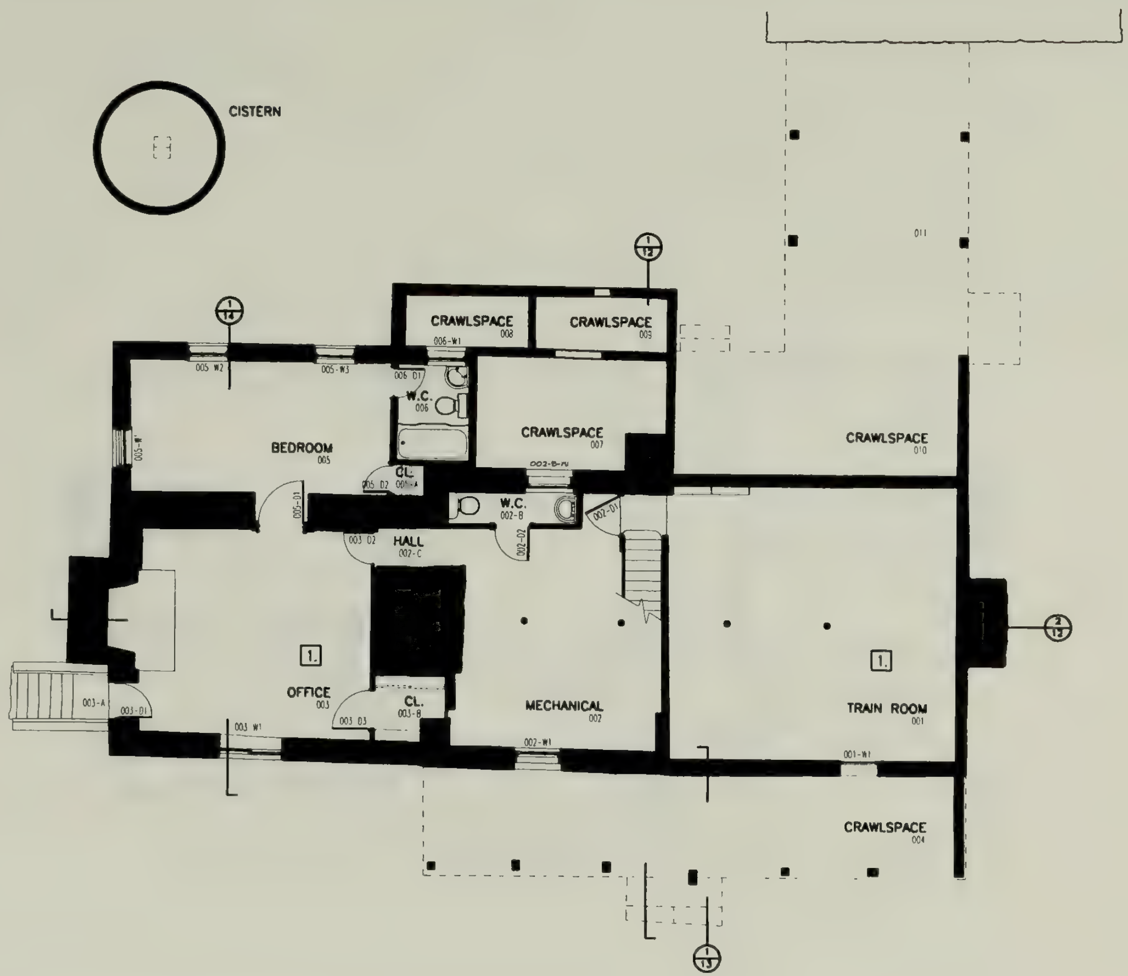
A	ASH	MB	MULBERRY
B	BASSWOOD	MG	MAGNOLIA
BE	BOX ELDER	P	PECAN
C	CYPRESS	PN	PIN OAK
CA	CRAB APPLE	PO	POST OAK
CL	CATALPA	PW	PUSSY WILLOW
CW	COTTONWOOD	RB	RED BUD
D	DOGWOOD	RO	RED OAK
E	ELM	RW	RIVER WILLOW
G	GINGKO	S	SYCAMORE
H	HOLLY	SF	SASAFRASS
HB	HACKBERRY	SG	SWEETGUM
HC	HORSE CHESTNUT	SO	SHINGLE OAK
HK	HICKORY	WC	WILD CHERRY
L	LOCUS	WN	WALNUT
M	MAPLE	WO	WHITE OAK



BASIS OF BEARING
GRID NORTH FROM MISSOURI STATE PLANE
COORDINATE MONUMENTATION, NORTH AMERICAN DATUM, 1983

NOTES

1. WALL FINISHES REMOVED 1991.

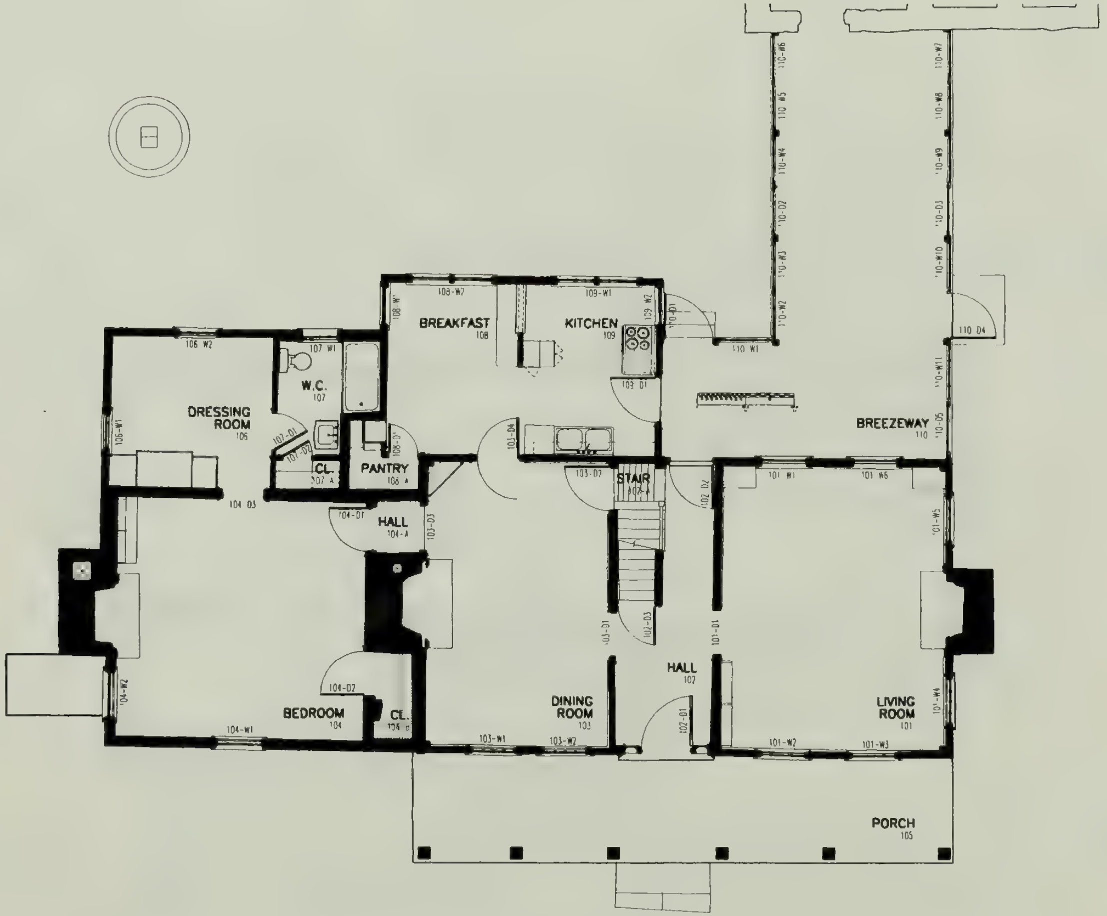

CISTERN
CRAWLSPACE 008
CRAWLSPACE 009
006-W1
005 W2
005-W3
006 D1
W.C. 006
CRAWLSPACE 007
002-B-N
BEDROOM 005
005-W1
CL. 001-A
005 D2
005-D1
W.C. 002-B
002-D1
002-D2
003 D2
HALL 002-C
CRAWLSPACE 010
011
1.
OFFICE 003
003-A
003-D1
003 W1
003 D3
CL. 003-B
MECHANICAL 002
002-W1
1.
TRAIN ROOM 001
001-W1
CRAWLSPACE 004
1/14
1/12
2/12
1/13

BASEMENT FLOOR PLAN

SCALE 1/4" = 1'-0"

0 1' 5' 10'

DESIGNED	SHEET TITLE	AUTOCAD FILE	DRAWING NO
	EXISTING CONDITIONS BASEMENT FLOOR PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	VHEKFP00	357/80002
DRAWN K. R. MAROLF TECH REV A. W. O'BRIGHT		SUB SHEET	SHEET 3
DATE JUNE 25, 1992			OF 43


110-W6
110 W5
110-W4
110-D2
110-W3
110-W2
110 W1
110-W7
110-W8
110-W9
110-D3
110-W10
110-W11
110 D4
110-D5
BREEZEWAY
110
108-W2
109-W1
108 W1
109 W2
110-D1
BREAKFAST
108
KITCHEN
109
109 D1
106 W2
107 W1
W.C.
107
DRESSING
ROOM
105
106-W1
107-D1
107-D2
CL.
107 A
108-D1
PANTRY
108 A
103-D4
103-D2
STAIR
102-A
102 D2
101 W1
101 W6
101-W5
104 D3
104-D1
HALL
104-A
103-D3
103-D1
102-D3
101-D1
HALL
102
104-W2
104-D2
BEDROOM
104
CL.
104 B
104-W1
DINING
ROOM
103
103-W1
103-W2
102-D1
LIVING
ROOM
101
101-W4
101-W2
101-W3
PORCH
105

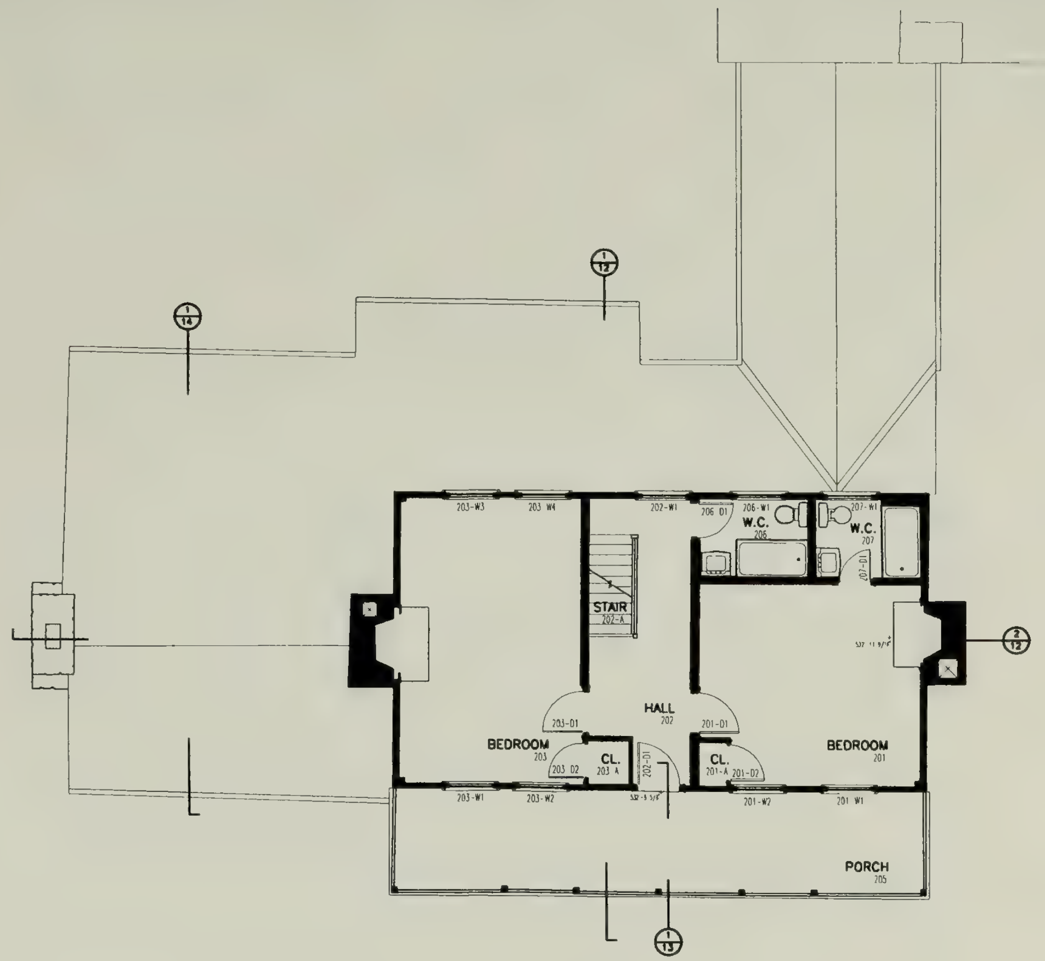
FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"

0 1' 5' 10'

REMOVED EARLY ADDITIONS

DESIGNED	SHEET TITLE EXISTING CONDITIONS FIRST FLOOR PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXFP01	DRAWING NO 357/80002
DRAWN K R MAROLF TECH REV A W O'BRIGHT		SUB SHEET	SHEET 4
DATE JUNE 25, 1992			OF 43

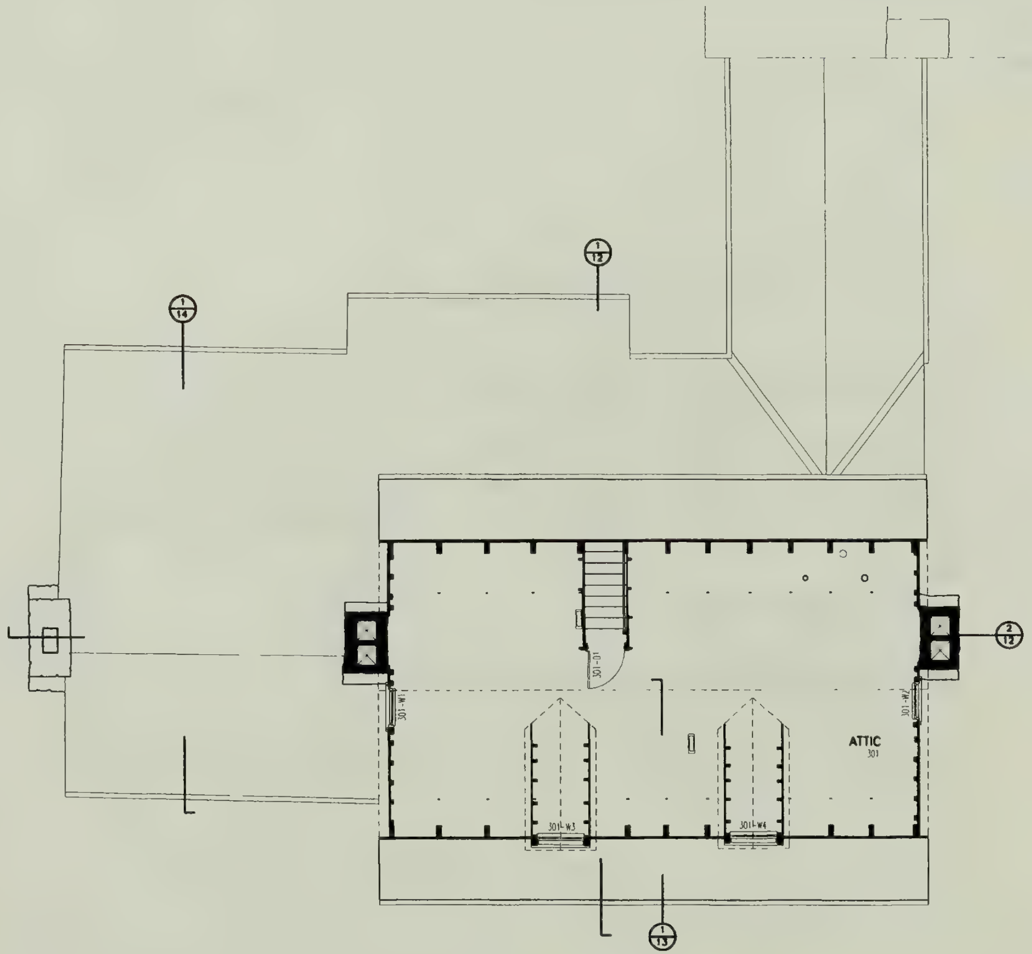

1
14
1
12
203-W3
203 W4
202-W1
206 D1
206-W1
W.C.
206
207-W1
W.C.
207
207-D1
STAIR
202-A
2
12
HALL
202
203-D1
201-D1
BEDROOM
203
203 D2
CL.
203 A
202-D1
CL.
201-A
201-D2
BEDROOM
201
203-W1
203-W2
201-W2
201 W1
PORCH
205
1
13

SECOND FLOOR PLAN

SCALE 1/4" 1' 0"

0 1' 5' 10'

DESIGNED	SHEET TITLE	AUTOCAD FILE MHEXFP02	DRAWING NO 357/80002
DRAWN K. R. MAROLF TECH REV A. W. O'BRIGHT	EXISTING CONDITIONS SECOND FLOOR PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	SUB SHEET	SHEET 5 OF 43
DATE JUNE 25, 1992			

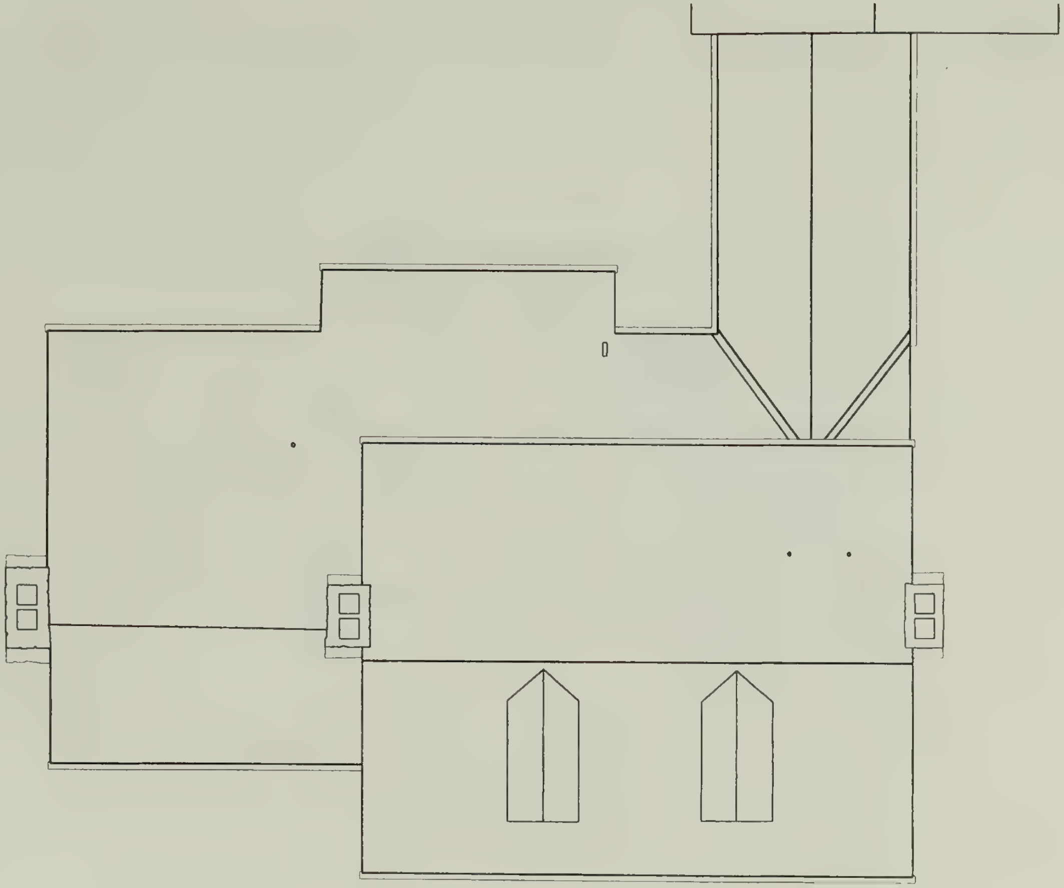

1
14
1
12
2
12
1
13
301-D1
301-W1
301-W2
301-W3
301-W4
ATTIC
301

ATTIC FLOOR PLAN

SCALE 1/4" = 1' 0"

0 1' 5' 10'

DESIGNED	SHEET TITLE EXISTING CONDITIONS ATTIC FLOOR PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHCXFP03	DRAWING NO 357/80002
DRAWN K R MAROLF TECH REV A W O'BRCHT		SUB SHEET	SHEET 6 OF 43
DATE JUNE 25, 1997			

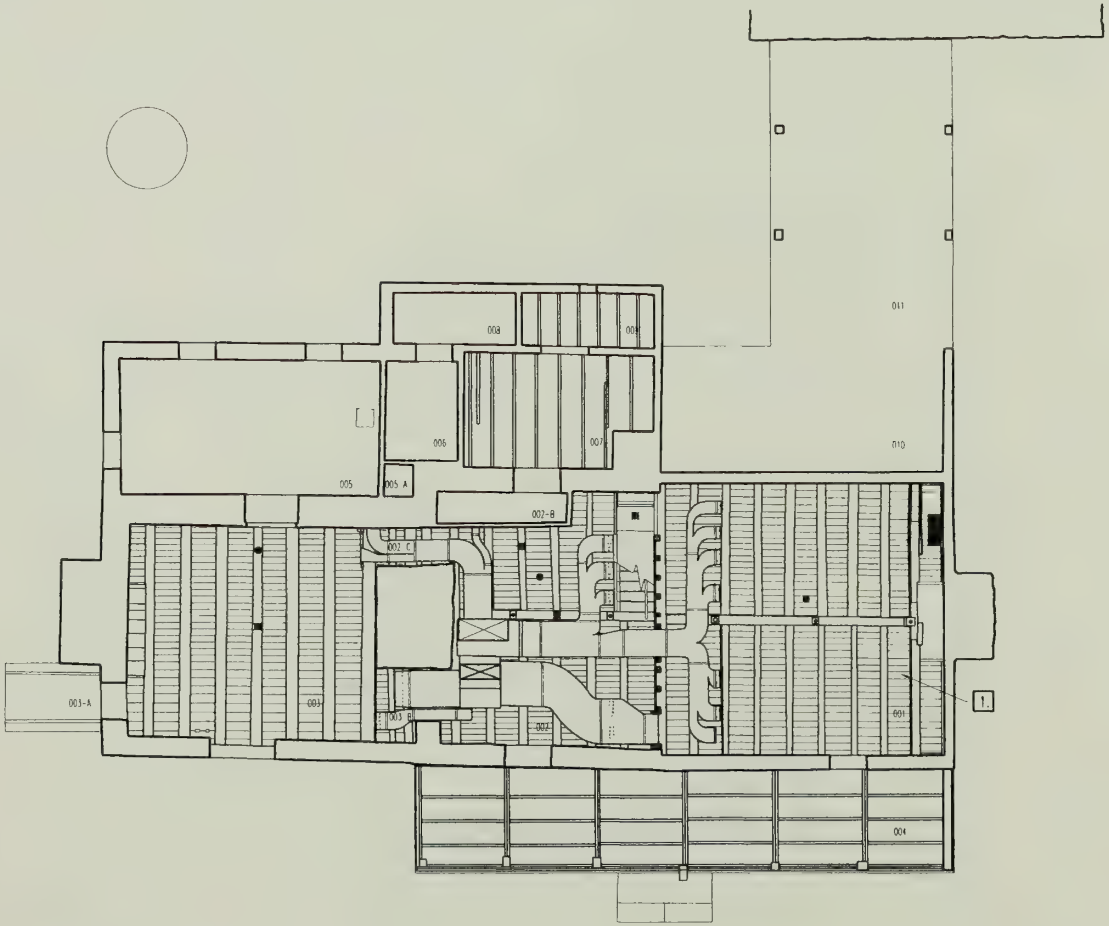


ROOF PLAN

SCALE 1/4" = 1'-0"

DESIGNED	SHEET TITLE EXISTING CONDITIONS ROOF PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE UHEXRP00	DRAWING NO 357/80002
DRAWN M. JOHNSON		SUB SHEET	SHEET 7
TECH REV A. W. O'BRIGHT			OF 43
DATE JUNE 25 1992			

1. GYPSUM WALL BOARD CEILING FINISHES REMOVED FROM THIS ROOM 1992.


011
010
008
009
007
006
005
005 A
002-B
002 C
003
003-A
003 B
002
001
004
1.

BASEMENT REFLECTED CEILING PLAN

SCALE 1/4" - 1'-0"
0 1' 5' 10'

DESIGNED

DRAWN
M JOHNSON
TECH REV
A. W. O'BRIGHT
DATE
JUNE 25 1992

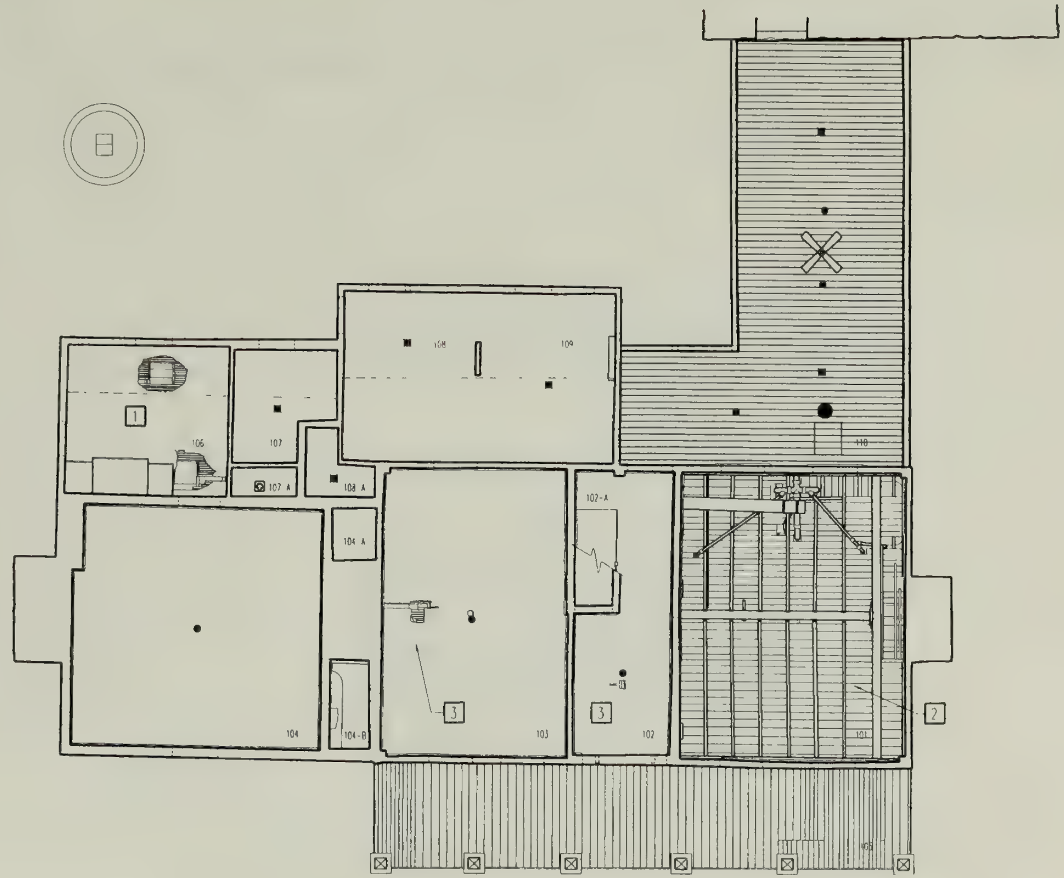
SHEET TITLE
EXISTING CONDITIONS
BASEMENT REFLECTED CEILING PLAN
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEXRC00
SUB SHEET

DRAWING NO
357/80002
SHEET 8
OF 43

NOTES

1. PLASTER FINISHES REMOVED FROM SELECTED AREAS OF THIS ROOM PRIOR TO 1990
2. SUSPENDED PLASTER AND METAL LATH CEILING FINISHES REMOVED FROM THIS ROOM 1992
3. PLASTER CEILING FINISHES SELECTIVELY REMOVED FROM THIS ROOM 1993


1
106
107
107 A
108 A
108
109
110
104 A
104
104-B
3
103
102-A
3
102
2
101
105

FIRST FLOOR REFLECTED CEILING PLAN

SCALE 1/4" = 1'-0"
0 1' 5' 10'

DESIGNED

DRAWN
M. JOHNSON
TECH. REV.
A. W. O'BRIGHT

DATE
JUNE 25 1997

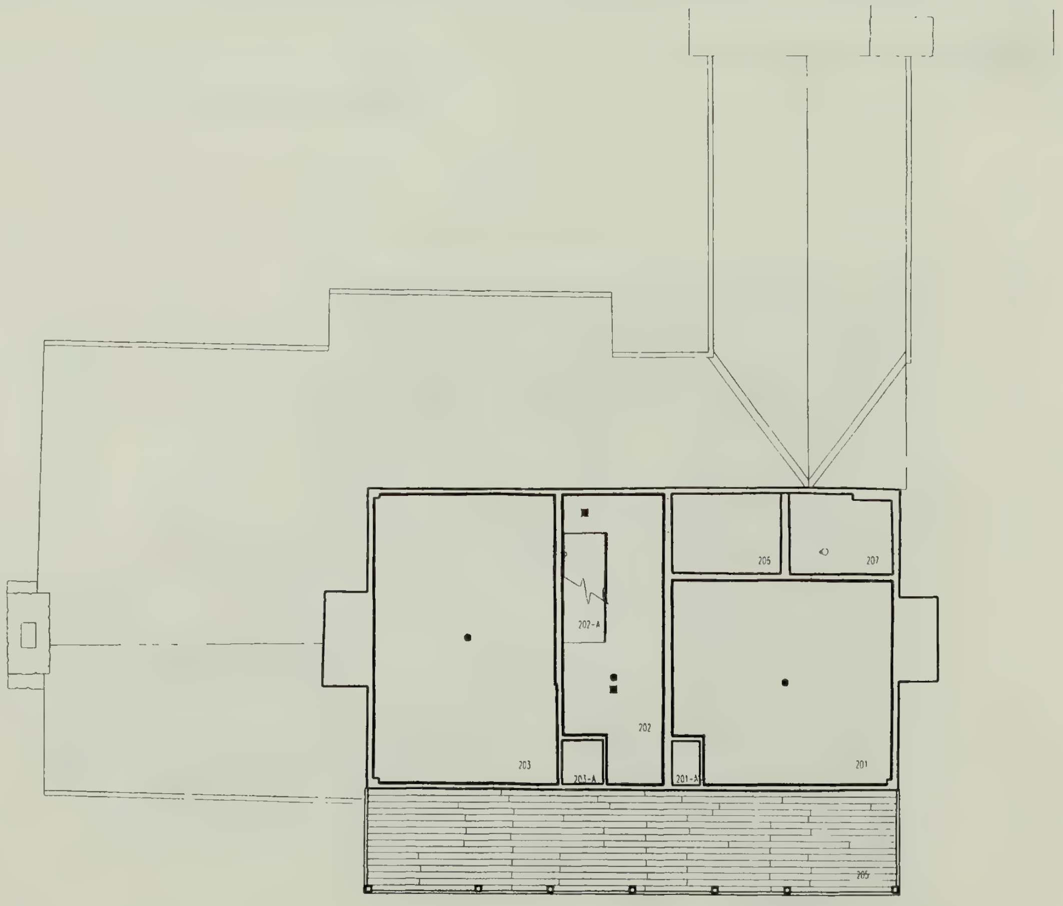
SHEET TITLE
EXISTING CONDITIONS
FIRST FLOOR REFLECTED CEILING PLAN
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEXRC01

SUB SHEET

DRAWING NO.
357/80002

SHEET 9
OF 43

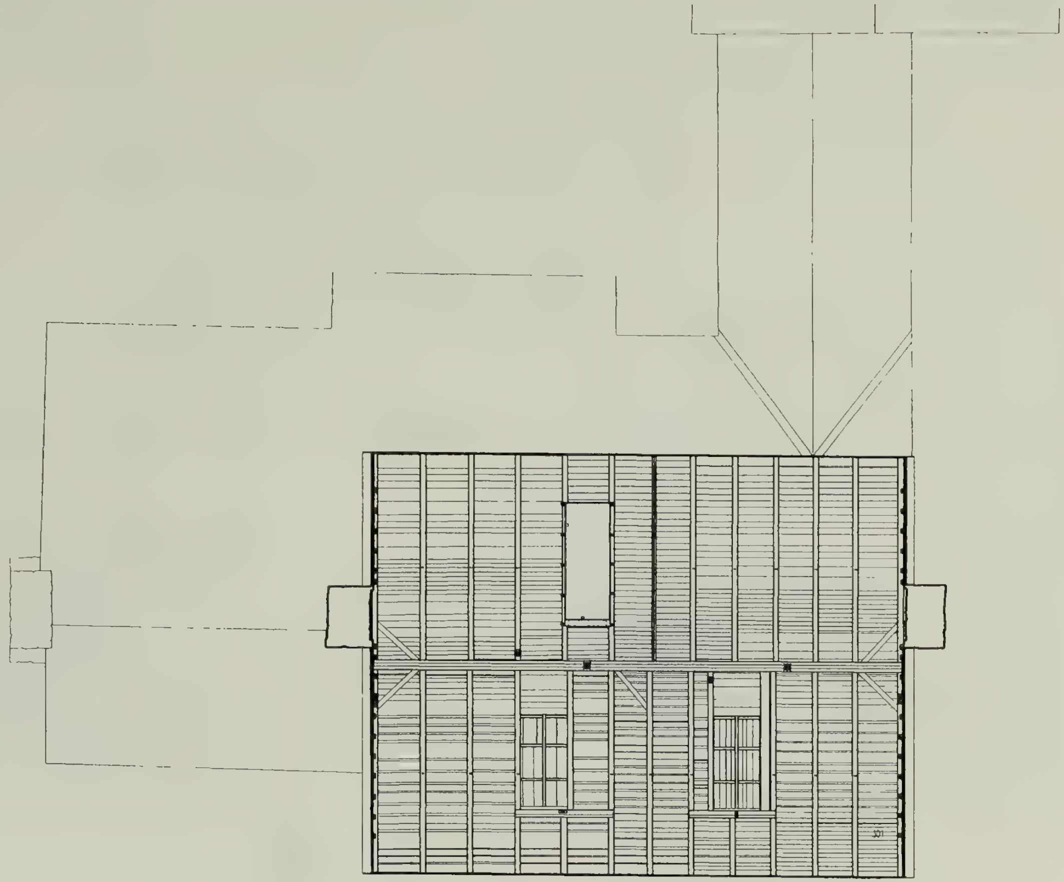

203
202-A
202
203-A
205
207
201-A
201
205

SECOND FLOOR REFLECTED CEILING PLAN

SCALE 1/4" 1'-0"

0 1' 5' 10'

DESIGNED	SHEET TITLE EXISTING CONDITIONS SECOND FLOOR REFLECTED CEILING PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXRC02	DRAWING NO 357/80002
DRAWN L M JOHNSON TECH REV A W O'BRIGHT		SUB SHEET	SHEET 10 OF 43
DATE JUNE 25 1992			



ATTIC FLOOR REFLECTED CEILING PLAN

SCALE 1/4" - 1' 0"

0 1' 5' 10'

DESIGNED

DRAWN
L. M. JOHNSON

TECH REV
A. W. O'BRIGHT

DATE
5/20/93 MAY 25 1992

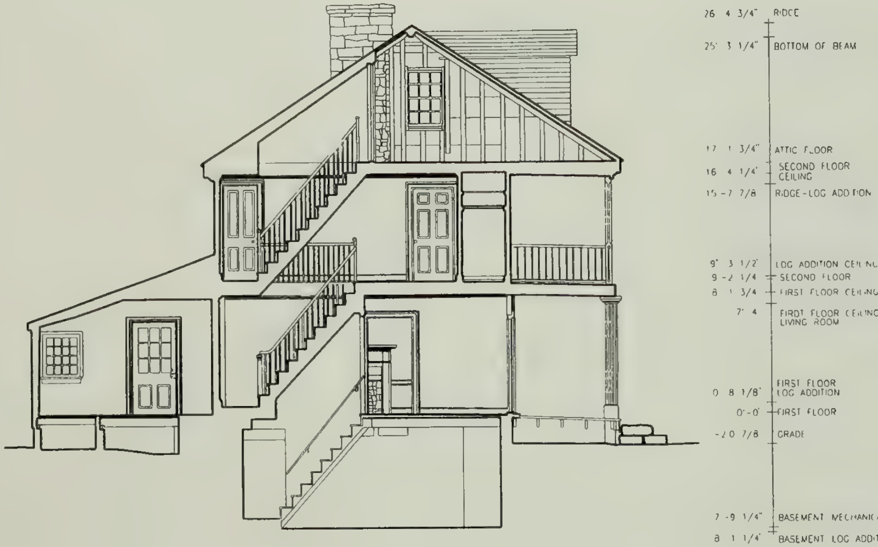
SHEET TITLE
EXISTING CONDITIONS
ATTIC FLOOR REFLECTED CEILING PLAN
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEXRC03

SUB SHEET

DRAWING NO
357/80002

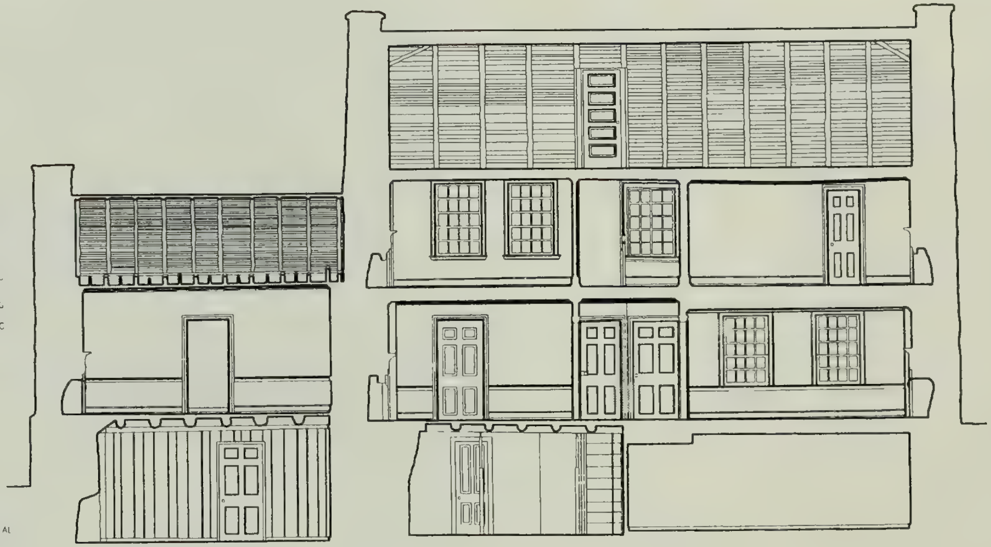
SHEET 11
OF 43


26 4 3/4" RIDGE
25' 3 1/4" BOTTOM OF BEAM
17 1 3/4" ATTIC FLOOR
16 4 1/4" SECOND FLOOR CEILING
15 -7 7/8 RIDGE-LOG ADDITION
9' 3 1/2' LOG ADDITION CEILING
9 -2 1/4 SECOND FLOOR
8 1 3/4 FIRST FLOOR CEILING
7' 4 FIRST FLOOR CEILING LIVING ROOM
0 8 1/8" FIRST FLOOR LOG ADDITION
0'-0' FIRST FLOOR
-2 0 7/8 GRADE
7 -9 1/4" BASEMENT MECHANICAL
8 1 1/4' BASEMENT LOG ADDITION

1/12 TRANSVERSE SECTION

SCALE 1/4" - 1'-0"

0 1' 5' 10'

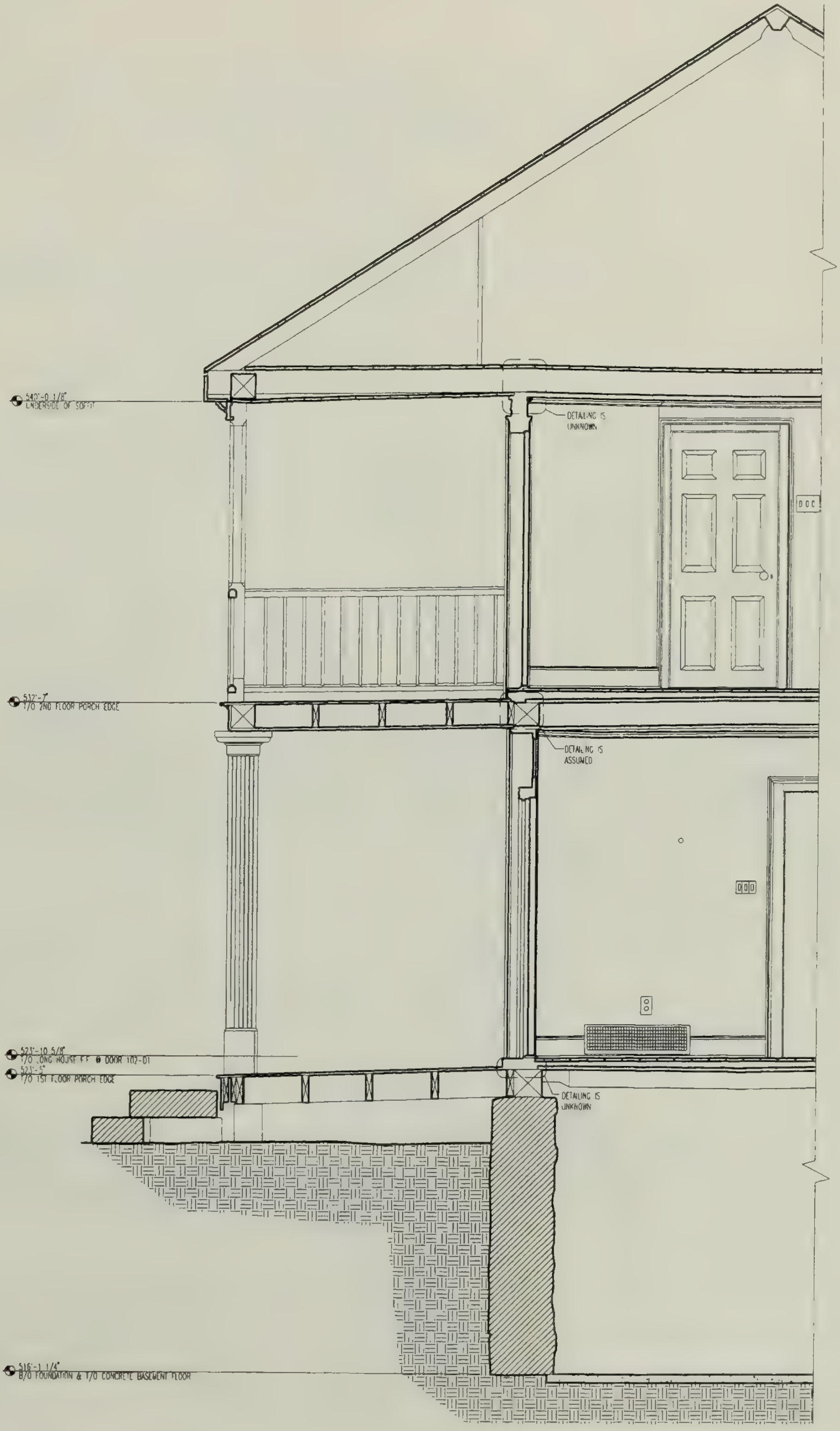


2/12 LONGITUDINAL SECTION

SCALE 1/4" = 1'-0"

0 1' 5' 10'

DESIGNED	SHEET TITLE EXISTING CONDITIONS BUILDING SECTIONS MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXSE01	DRAWING NO 357/80002
DRAWN HABS 1991 TECH REV A W O'BRIGHT		SUB SHEET	SHEET 12 OF 43
DATE JUNE 25, 1992			


540'-0 1/8"
UNDERSIDE OF SOFFIT
DETAILING IS
UNKNOWN
512'-7"
T/O 2ND FLOOR PORCH EDGE
DETAILING IS
ASSUMED
523'-10 5/8"
T/O LONG HOUSE FF @ DOOR 102-D1
523'-5"
T/O 1ST FLOOR PORCH EDGE
DETAILING IS
UNKNOWN
516'-1 1/4"
B/O FOUNDATION & T/O CONCRETE BASEMENT FLOOR

1/13 PORCH SECTION

SCALE 3/4" = 1' 0"

0
6"
1'
3'

DESIGNED

DRAWN
I W JOHNSON
TECH REV
A W O'BRICHI

DATE
JUNE 25 1992

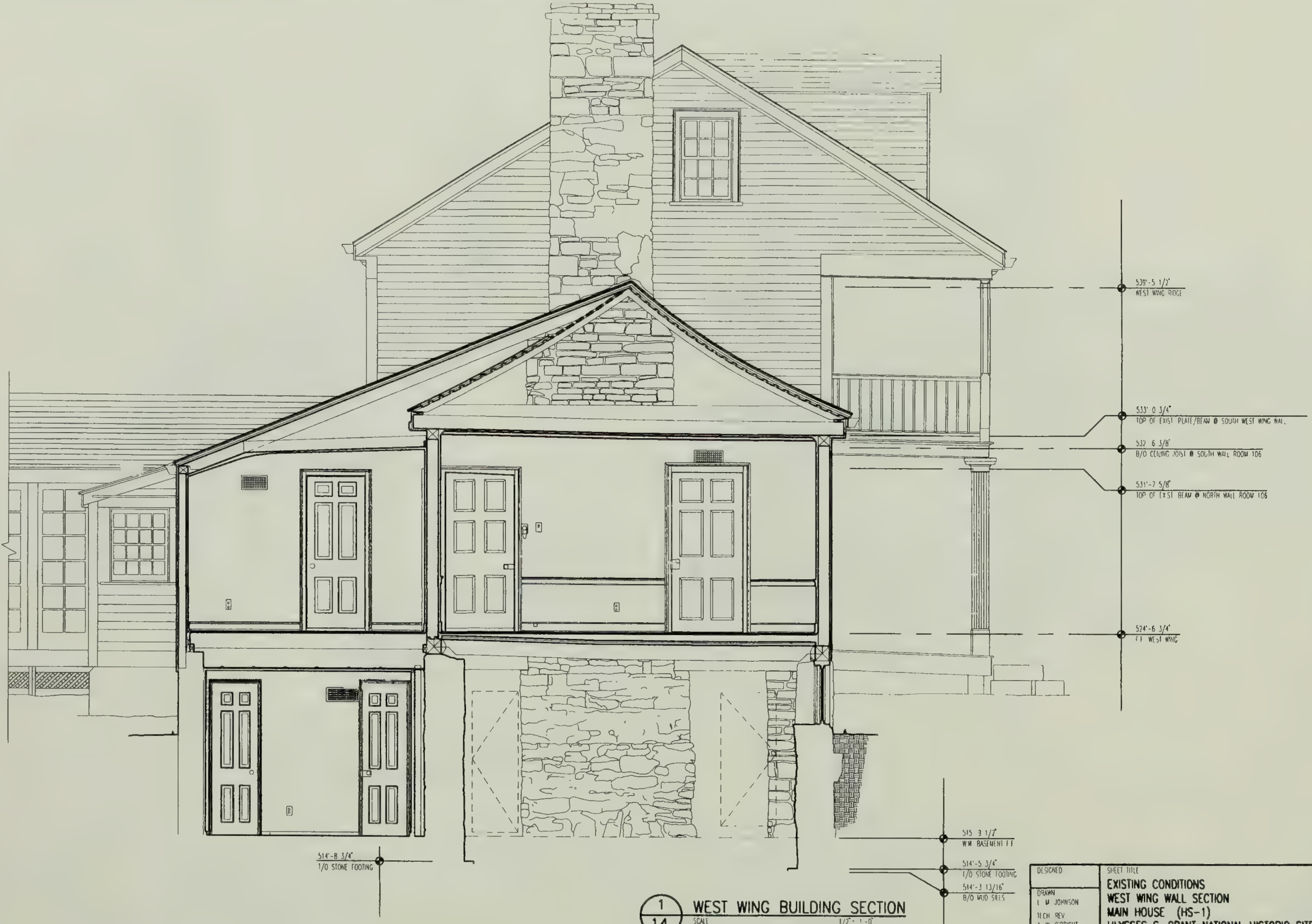
SHEET TITLE
EXISTING CONDITIONS
PORCH SECTION
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
WHEXSEPO

SUB SHEET

DRAWING NO
357/80002

SHEET 13
OF 43


539'-5 1/2"
WEST WING RIDGE
533' 0 3/4"
TOP OF EXIST PLATE/BEAM @ SOUTH WEST WING WAL.
532 6 3/8"
B/O CEILING JOIST @ SOUTH WALL ROOM 106
531'-7 5/8"
TOP OF EXST BEAM @ NORTH WALL ROOM 106
524'-6 3/4"
F.F. WEST WING
515 3 1/2"
W.W. BASEMENT F.F.
514'-5 3/4"
T/O STONE FOOTING
514'-3 13/16"
B/O MUD SILLS
514'-8 3/4"
T/O STONE FOOTING

1/14 WEST WING BUILDING SECTION

SCALE 1/2" = 1'-0"

0 6" 1' 3'

DESIGNED

DRAWN
I. M. JOHNSON

TECH REV
A. W. O'BRIGHT

DATE
JUNE 25, 1992

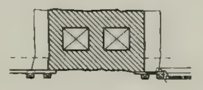
SHEET TITLE
EXISTING CONDITIONS
WEST WING WALL SECTION
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
WHEXSEWW

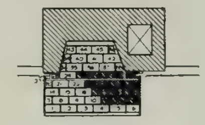
SUB SHEET

DRAWING NO
357/80002

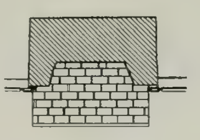
SHEET 14
OF 43



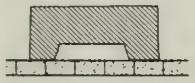
1/15 EXISTING ATTIC FLOOR PLAN



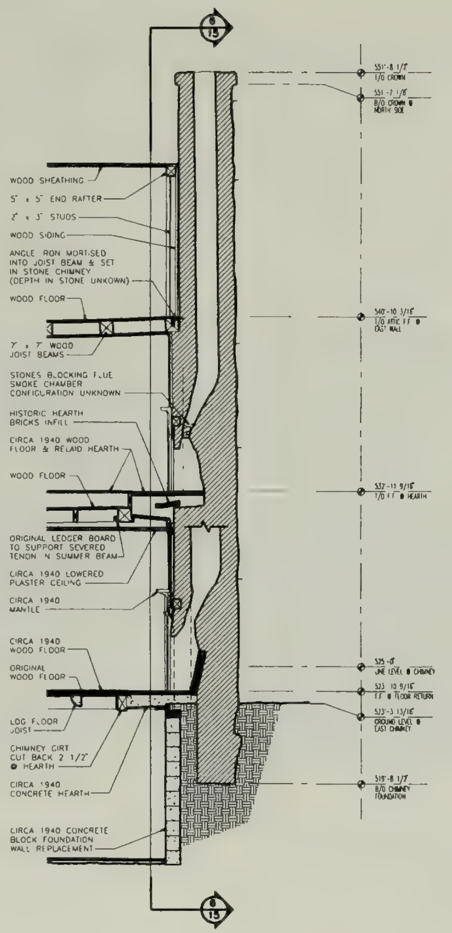
2/15 EXISTING SECOND FLOOR PLAN



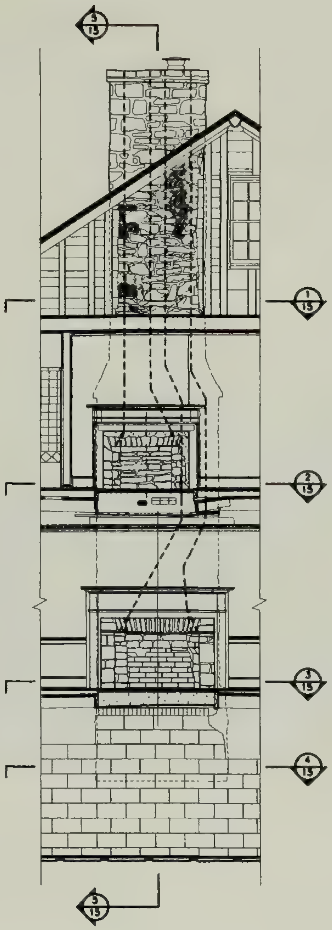
3/15 EXISTING FIRST FLOOR PLAN



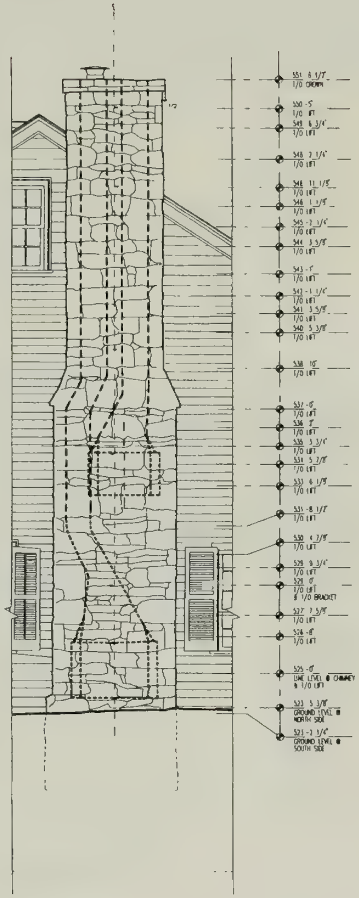
4/15 EXISTING CHIMNEY FOUNDATION PLAN


6/15
WOOD SHEATHING
5" x 5" END RAFTER
2" x 3" STUDS
WOOD SIDING
ANGLE IRON MORTISED INTO JOIST BEAM & SET IN STONE CHIMNEY (DEPTH IN STONE UNKOWN)
WOOD FLOOR
7" x 7" WOOD JOIST BEAMS
STONES BLOCKING FLUE SMOKE CHAMBER CONFIGURATION UNKNOWN
HISTORIC HEARTH BRICKS INFILL
CIRCA 1940 WOOD FLOOR & RELAID HEARTH
WOOD FLOOR
ORIGINAL LEDGER BOARD TO SUPPORT SEVERED TENON IN SUMMER BEAM
CIRCA 1940 LOWERED PLASTER CEILING
CIRCA 1940 MANTLE
CIRCA 1940 WOOD FLOOR
ORIGINAL WOOD FLOOR
LOG FLOOR JOIST
CHIMNEY GIRT CUT BACK 2 1/2" @ HEARTH
CIRCA 1940 CONCRETE HEARTH
CIRCA 1940 CONCRETE BLOCK FOUNDATION WALL REPLACEMENT
551'-8 1/2" T/O CROWN
551'-7 1/8" B/O CROWN @ NORTH SIDE
540'-10 3/16" T/O ATTIC F.F. @ EAST WALL
532'-11 9/16" T/O F.F. @ HEARTH
525'-0" LINE LEVEL @ CHIMNEY
523' 10 9/16" F.F. @ FLOOR RETURN
523'-3 13/16" GROUND LEVEL @ EAST CHIMNEY
519'-8 1/2" B/O CHIMNEY FOUNDATION

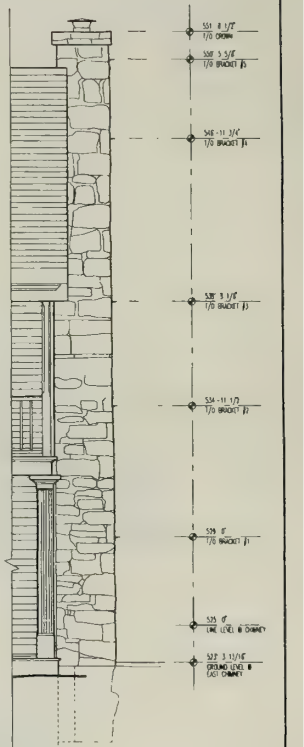
5/15 CHIMNEY SECTION


5/15
1/15
2/15
3/15
4/15

6/15 INT. ELEV. OF EAST CHIMNEY

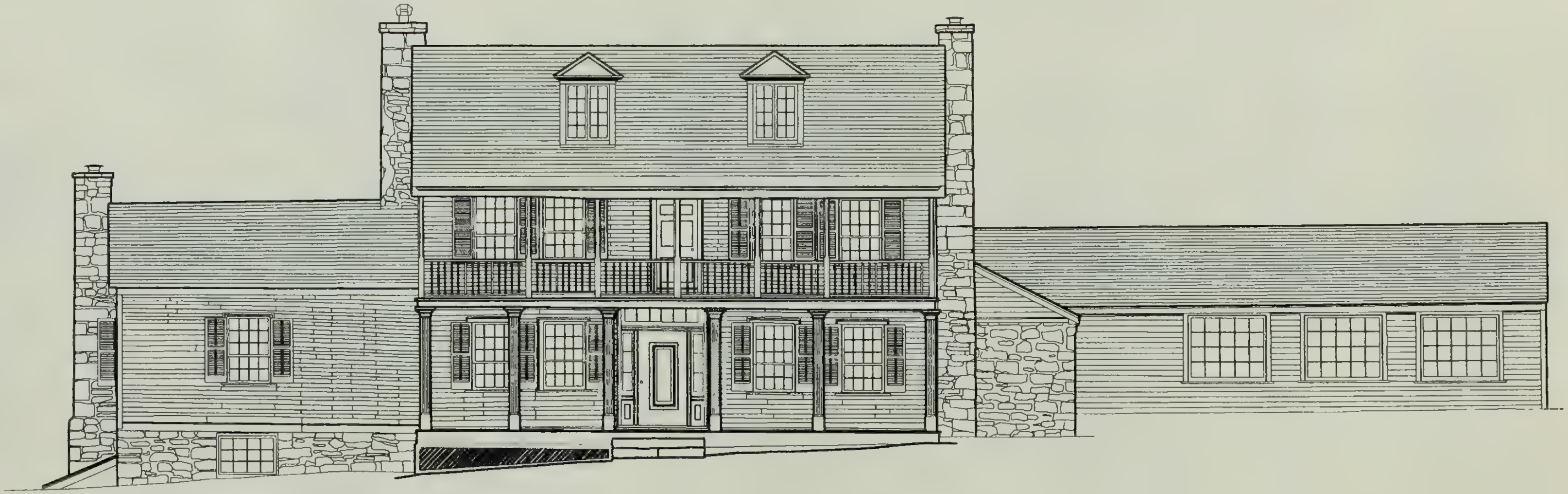

551' 8 1/2" T/O CROWN
550'-5" T/O LIFT
549' 6 3/4" T/O LIFT
548' 7 1/4" T/O LIFT
546' 11 1/8" T/O LIFT
546' 1 1/8" T/O LIFT
545'-7 1/4" T/O LIFT
544' 3 5/8" T/O LIFT
543'-1" T/O LIFT
542'-1 1/4" T/O LIFT
541' 3 5/8" T/O LIFT
540' 5 3/8" T/O LIFT
538' 10" T/O LIFT
537'-0" T/O LIFT
536' 7" T/O LIFT
535' 3 3/4" T/O LIFT
534' 5 7/8" T/O LIFT
533' 6 1/8" T/O LIFT
531'-8 1/2" T/O LIFT
530' 4 7/8" T/O LIFT
529' 9 3/4" T/O LIFT
529' 0" T/O LIFT & T/O BRACKET
527' 7 5/8" T/O LIFT
526'-8" T/O LIFT
525'-0" LINE LEVEL @ CHIMNEY & T/O LIFT
523' 5 3/8" GROUND LEVEL @ NORTH SIDE
523'-2 1/4" GROUND LEVEL @ SOUTH SIDE

EAST CHIMNEY ELEVATION


551' 8 1/2" T/O CROWN
550' 5 5/8" T/O BRACKET #5
546'-11 3/4" T/O BRACKET #4
538' 3 1/8" T/O BRACKET #3
534'-11 1/2" T/O BRACKET #2
529' 0" T/O BRACKET #1
525' 0" LINE LEVEL @ CHIMNEY
523' 3 13/16" GROUND LEVEL @ EAST CHIMNEY

SOUTH CHIMNEY ELEVATION

DESIGNED	SHEET TITLE	AUTOCAD FILE	DRAWING NO
DRAWN L M JOHNSON TECH REV A W O'BRIGHT DATE JUNE 25, 1992	EXISTING CONDITIONS EAST CHIMNEY SECTIONS, ELEVTNS & PLANS MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	MHEXSECH SUB SHEET	357/80002 SHEET 15 OF 42



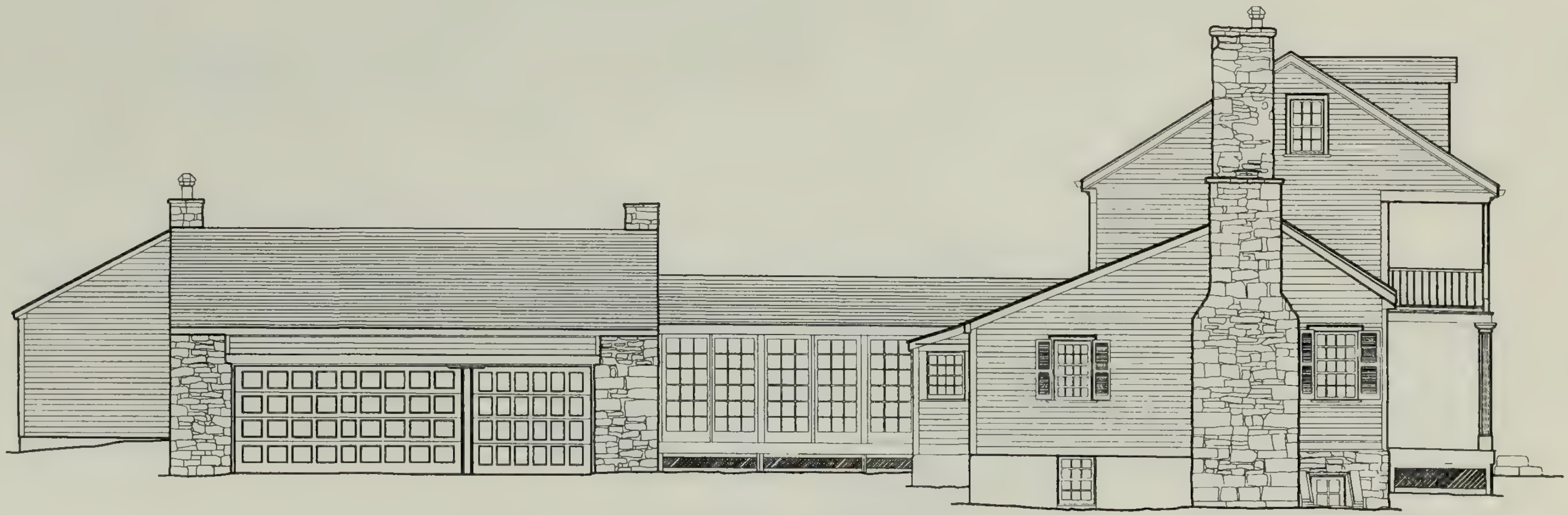
SOUTH EXTERIOR ELEVATION

SCALE 1/4" = 1' 0"

0 1' 5' 10'

EXISTING ELEVATIONS FROM HABS, 1991

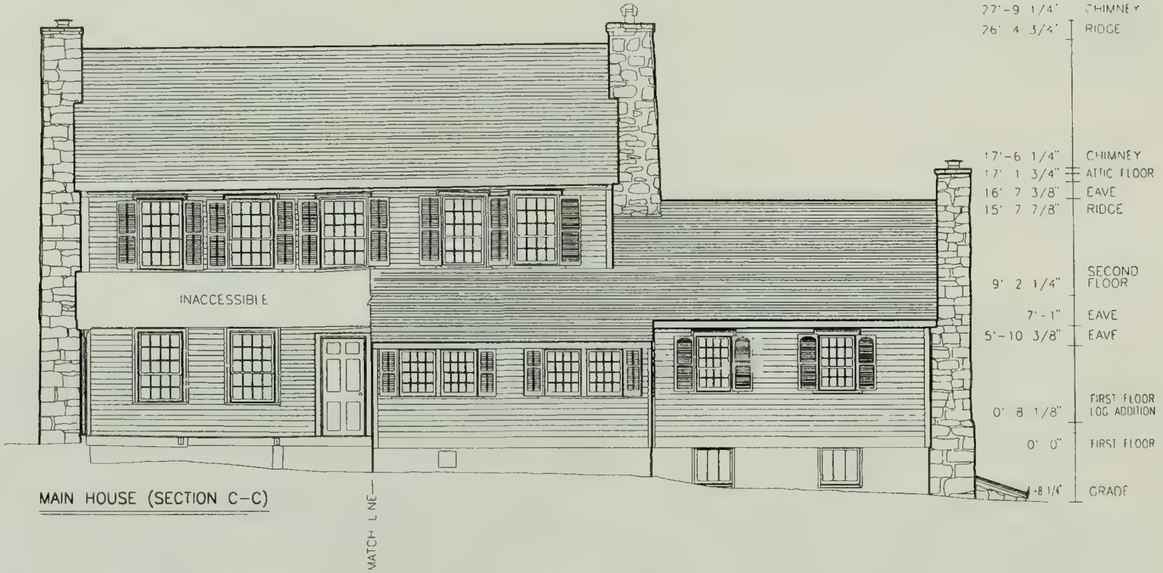
DESIGNED	SHEET TITLE EXISTING CONDITIONS SOUTH EXTERIOR ELEVATION MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE WHEXEE1S	DRAWING NO 357/80002
DRAWN K R MAROLF L M JOHNSON TECH REV A W O'BRIGHT		SUB SHEET	SHEET 16 OF 43
DATE JUNE 25, 1992			



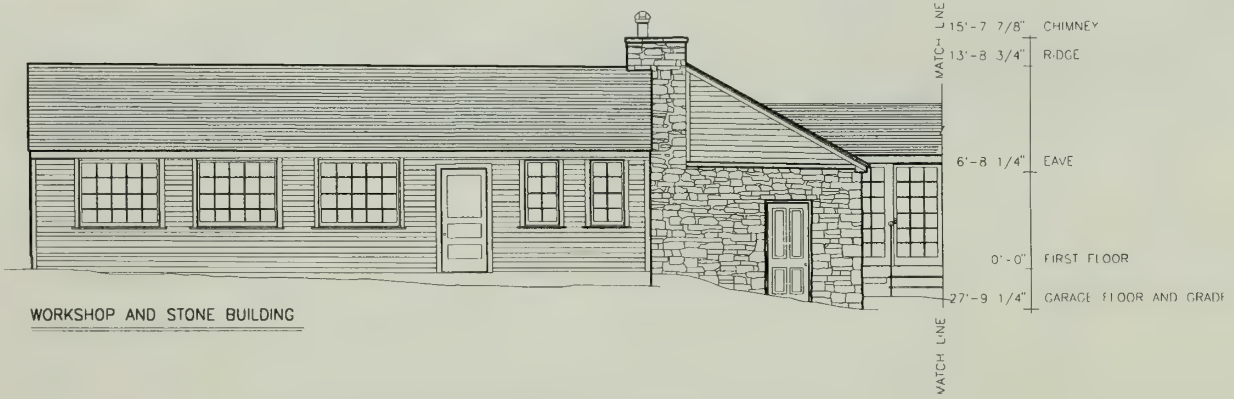
WEST EXTERIOR ELEVATION
SCALE 1/4" - 1' 0"
0 1' 5' 10'

EXISTING ELEVATIONS FROM HABS, 1991

DESIGNED	SHEET TITLE EXISTING CONDITIONS WEST EXTERIOR ELEVATION MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXEL1W	DRAWING NO 357/80002
DRAWN L M JOHNSON TECH REV A W O'BRIGHT		SUB SHEET	SHEET 17 OF 43
DATE JUNE 25 1997			


27'-9 1/4" CHIMNEY
26' 4 3/4" RIDGE
17'-6 1/4" CHIMNEY
17' 1 3/4" ATTIC FLOOR
16' 7 3/8" EAVE
15' 7 7/8" RIDGE
9' 2 1/4" SECOND FLOOR
7'-1" EAVE
5'-10 3/8" EAVE
0' 8 1/8" FIRST FLOOR LOG ADDITION
0' 0" FIRST FLOOR
-8 1/4" GRADE
INACCESSIBLE
MATCH LINE

MAIN HOUSE (SECTION C–C)


15'-7 7/8" CHIMNEY
13'-8 3/4" RIDGE
6'-8 1/4" EAVE
0'-0" FIRST FLOOR
-27'-9 1/4" GARAGE FLOOR AND GRADE
MATCH LINE
MATCH LINE

WORKSHOP AND STONE BUILDING

FIRST FLOOR PLAN
SCALE 1/4" - 1'-0"
0 1' 5' 10'

EXISTING ELEVATIONS FROM HABS, 1991

DESIGNED

DRAWN
L M JOHNSON

TECH REV
A W O'BRIGHT

DATE
JUNE 25, 1992

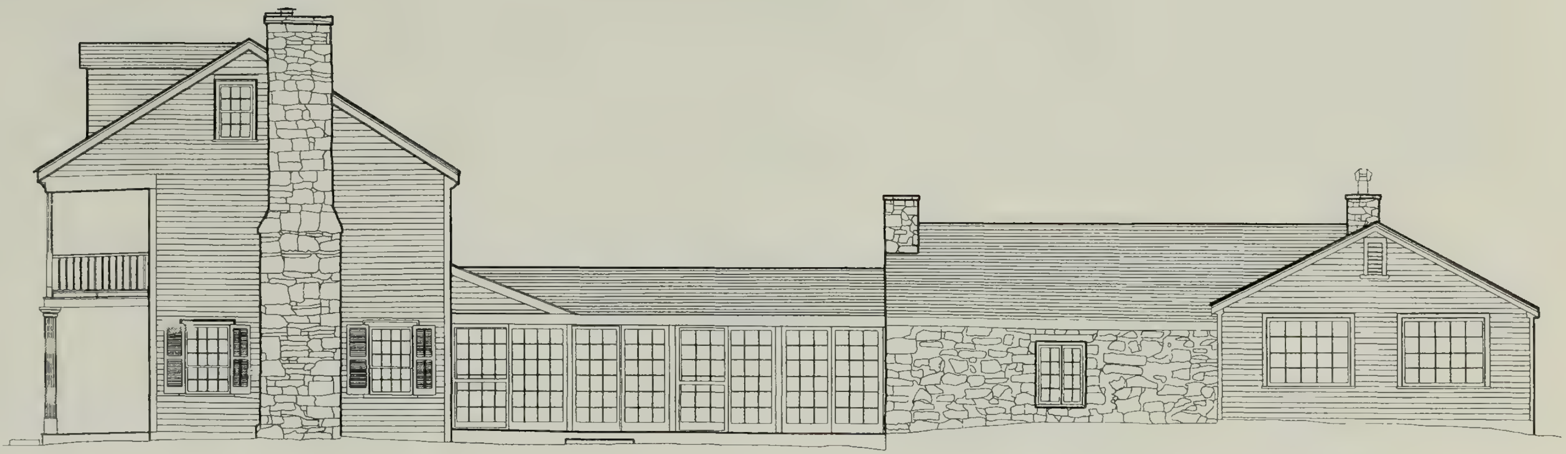
SHEET TITLE
EXISTING CONDITIONS
NORTH EXTERIOR ELEVATION
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEXEEIN

SUB SHEET

DRAWING NO
357/80002

SHEET 18
OF 43



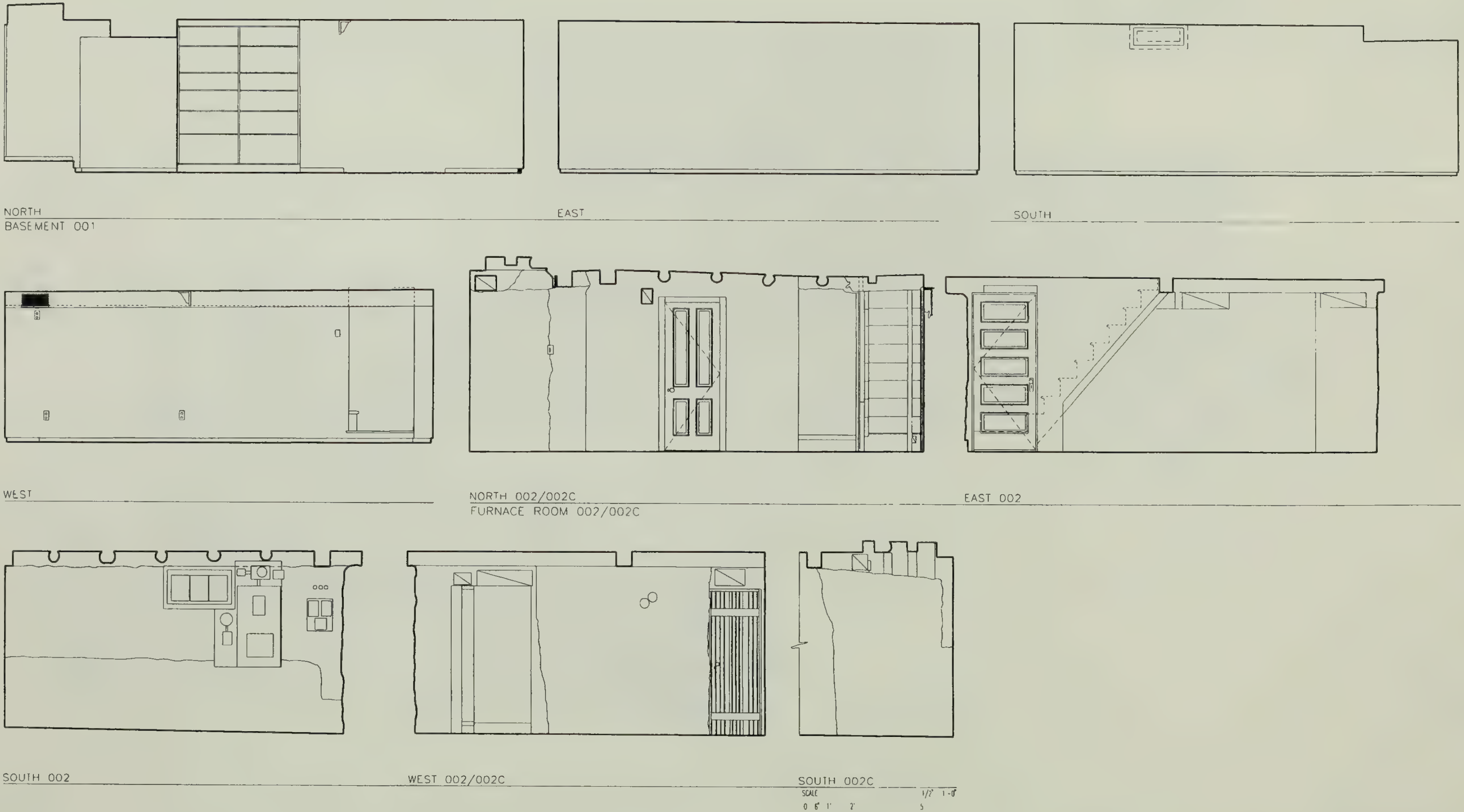
EAST EXTERIOR ELEVATION

SCALE 1/4" - 1'-0"

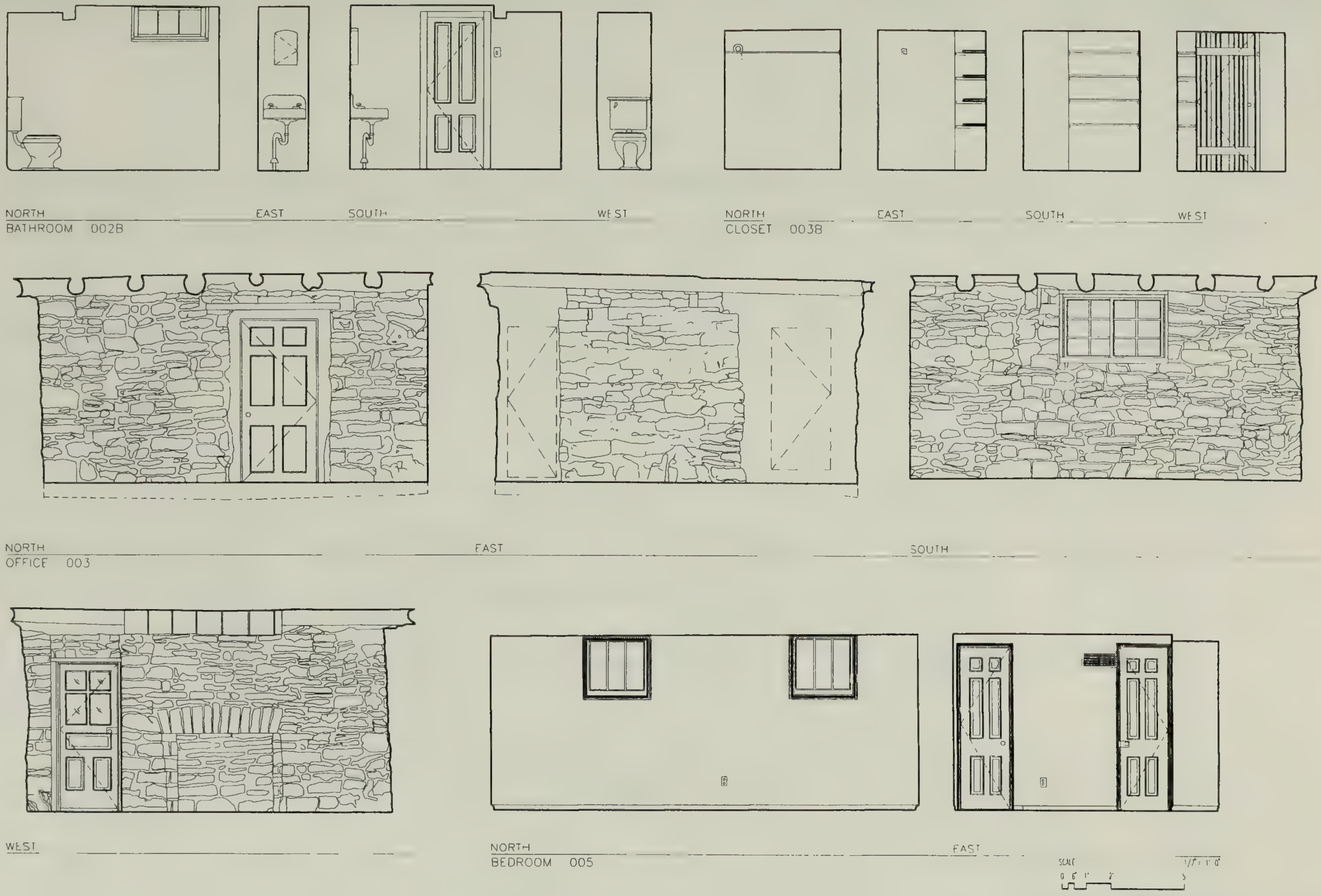
0 1' 5' 10'

EXISTING ELEVATIONS FROM HABS 1991

DESIGNED	SHEET TITLE EXISTING CONDITIONS EAST EXTERIOR ELEVATION MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXEE1E	DRAWING NO 357/80092
DRAWN K R MAROLF L M JOHNSON TECH REV A W O'BRIGHT		SUB SHEET	SHEET 19
DATE JUNE 25, 1992			OF 43


NORTH
BASEMENT 001
EAST
SOUTH
WEST
NORTH 002/002C
FURNACE ROOM 002/002C
EAST 002
SOUTH 002
WEST 002/002C
SOUTH 002C
SCALE
0 6" 1' 2' 5
1/2" 1'-0"

DESIGNED	SHEET TITLE	AUTOCAD FILE	DRAWING NO
DRAWN K R MAROLF TECH REV A W O'BRIGHT DATE JUNE 25 1992	EXISTING CONDITIONS INTERIOR ELEVATIONS/ROOMS 001-002C MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	WHEXIE01 SUB SHEET	357/80007 SHEET 20 OF 43


NORTH
BATHROOM 002B
EAST
SOUTH
WEST
NORTH
CLOSET 003B
EAST
SOUTH
WEST
NORTH
OFFICE 003
EAST
SOUTH
WEST
NORTH
BEDROOM 005
EAST
SCALE
1/2" = 1' 0"
0 6" 1' 2' 5

DESIGNED

DRAWN
K. R. MAROLF
TECH REV
A. W. O'BRIGHT

DATE
JUNE 25, 1992

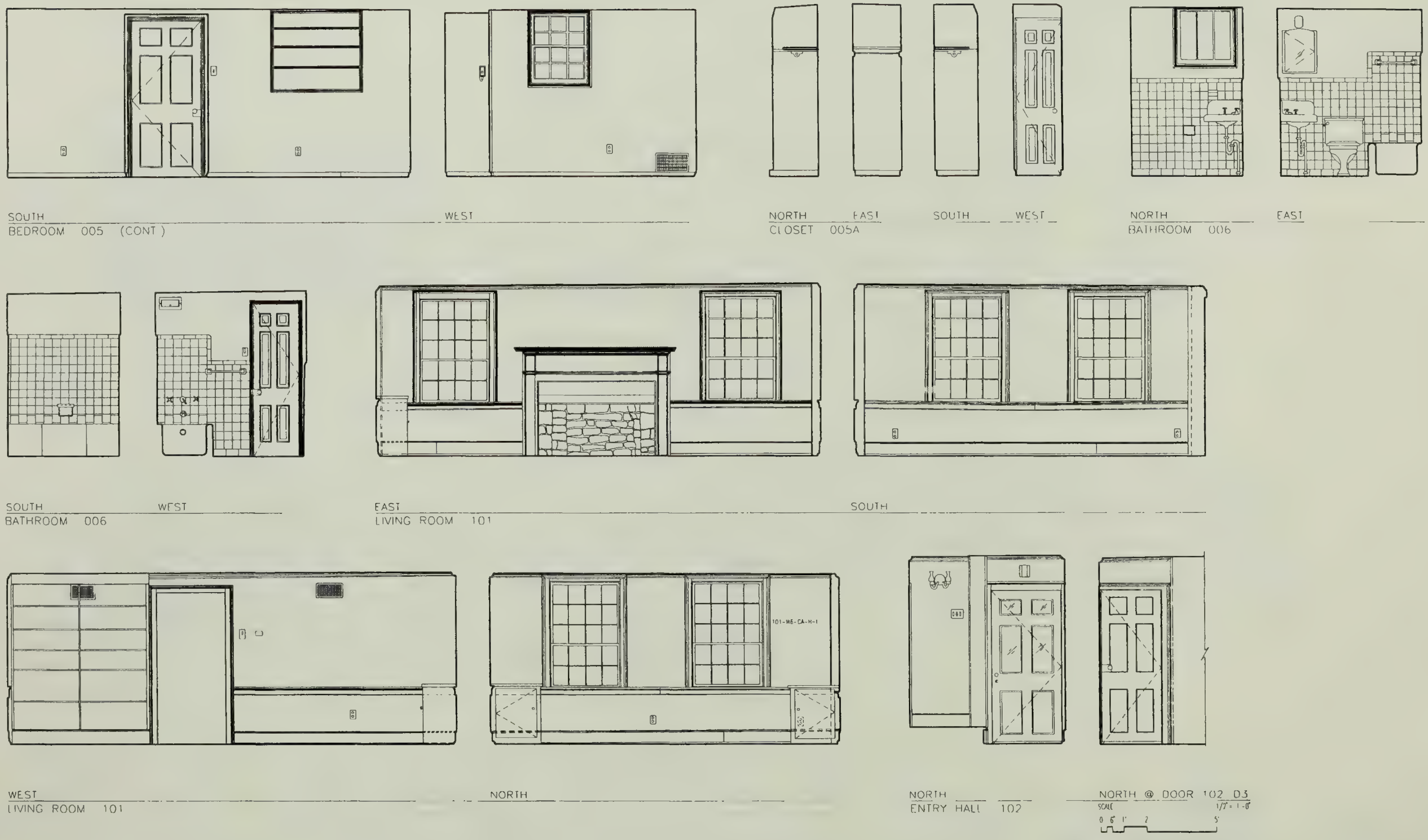
SHEET TITLE
EXISTING CONDITIONS
INTERIOR ELEVATIONS/ROOMS 002B-005
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEXIE02

SUB SHEET

DRAWING NO
357/80002

SHEET 21
OF 43


SOUTH
BEDROOM 005 (CONT)
WEST
NORTH
CLOSET 005A
EAST
SOUTH
WEST
NORTH
BATHROOM 006
EAST
SOUTH
BATHROOM 006
WEST
EAST
LIVING ROOM 101
SOUTH
101-W6-CA-H-1
WEST
LIVING ROOM 101
NORTH
NORTH
ENTRY HALL 102
NORTH @ DOOR 102 D3
SCALE
1/2" = 1'-0"
0 6" 1' 2 5'

DESIGNED

DRAWN
K. R. MAROLF
TECH REV
A. W. OBRICHT

DATE
JUNE 25, 1992

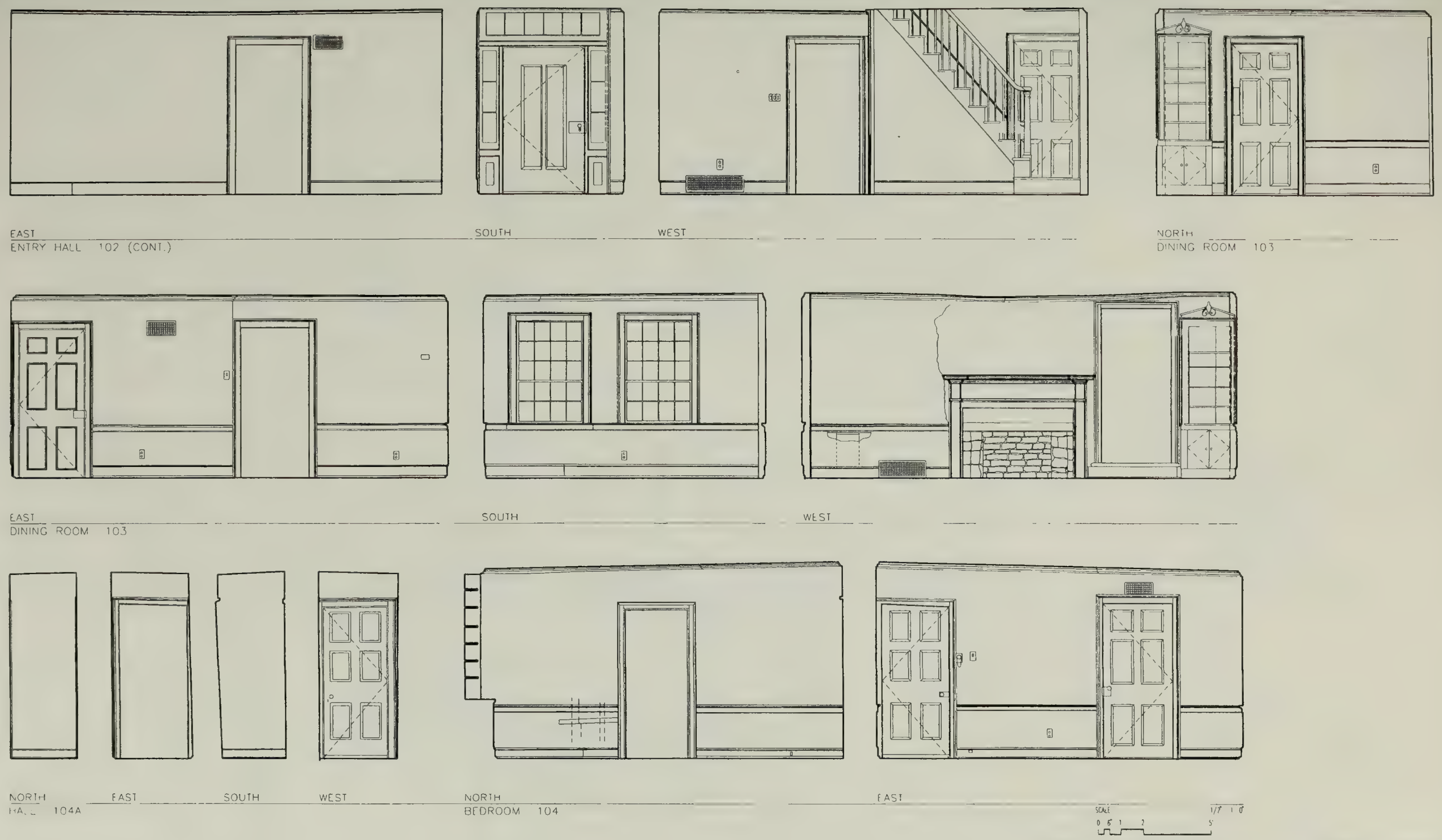
SHEET TITLE
EXISTING CONDITIONS
INTERIOR ELEVATIONS/ROOMS 005-102
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEXIT03

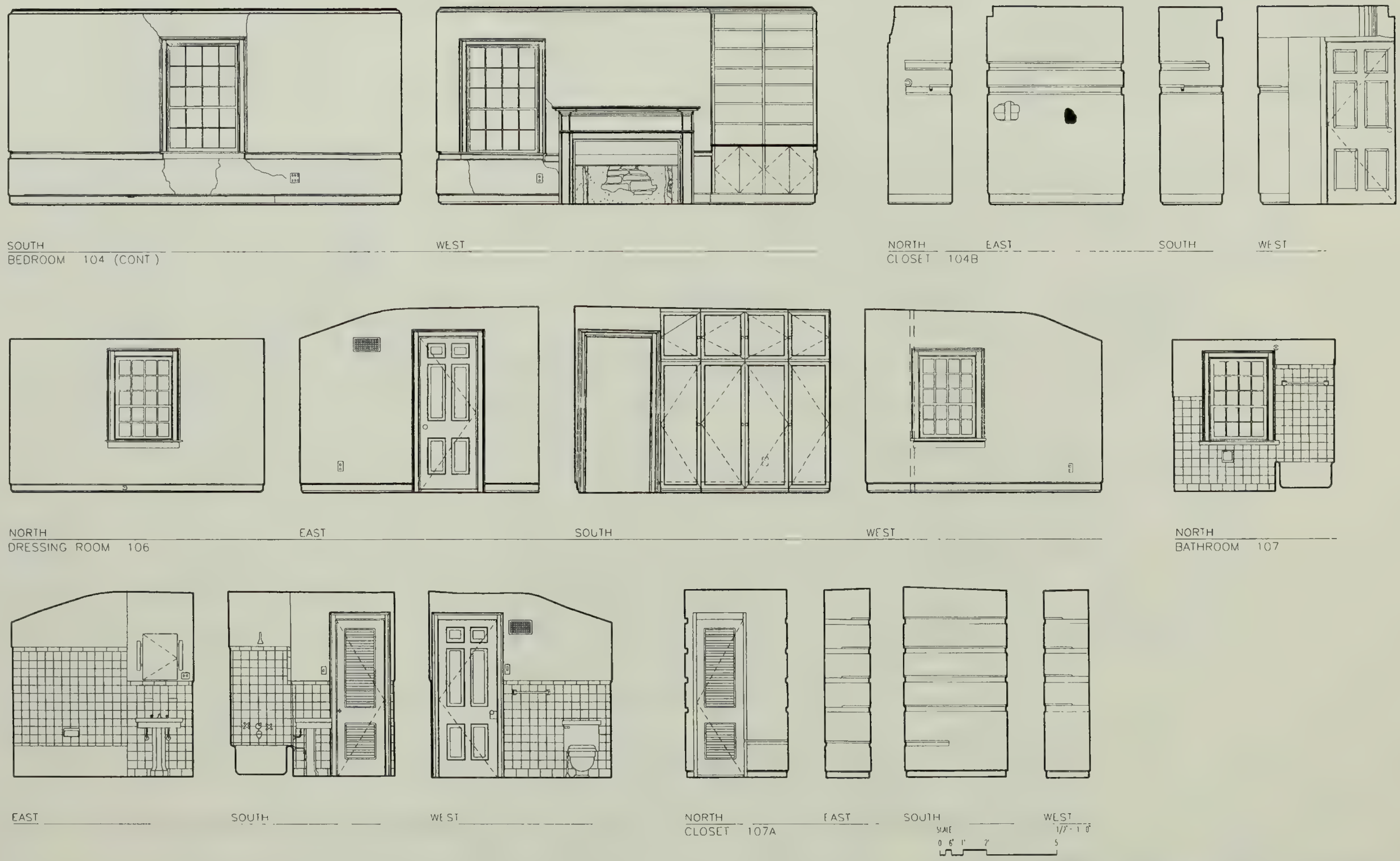
SUB SHEET

DRAWING NO
357/80002

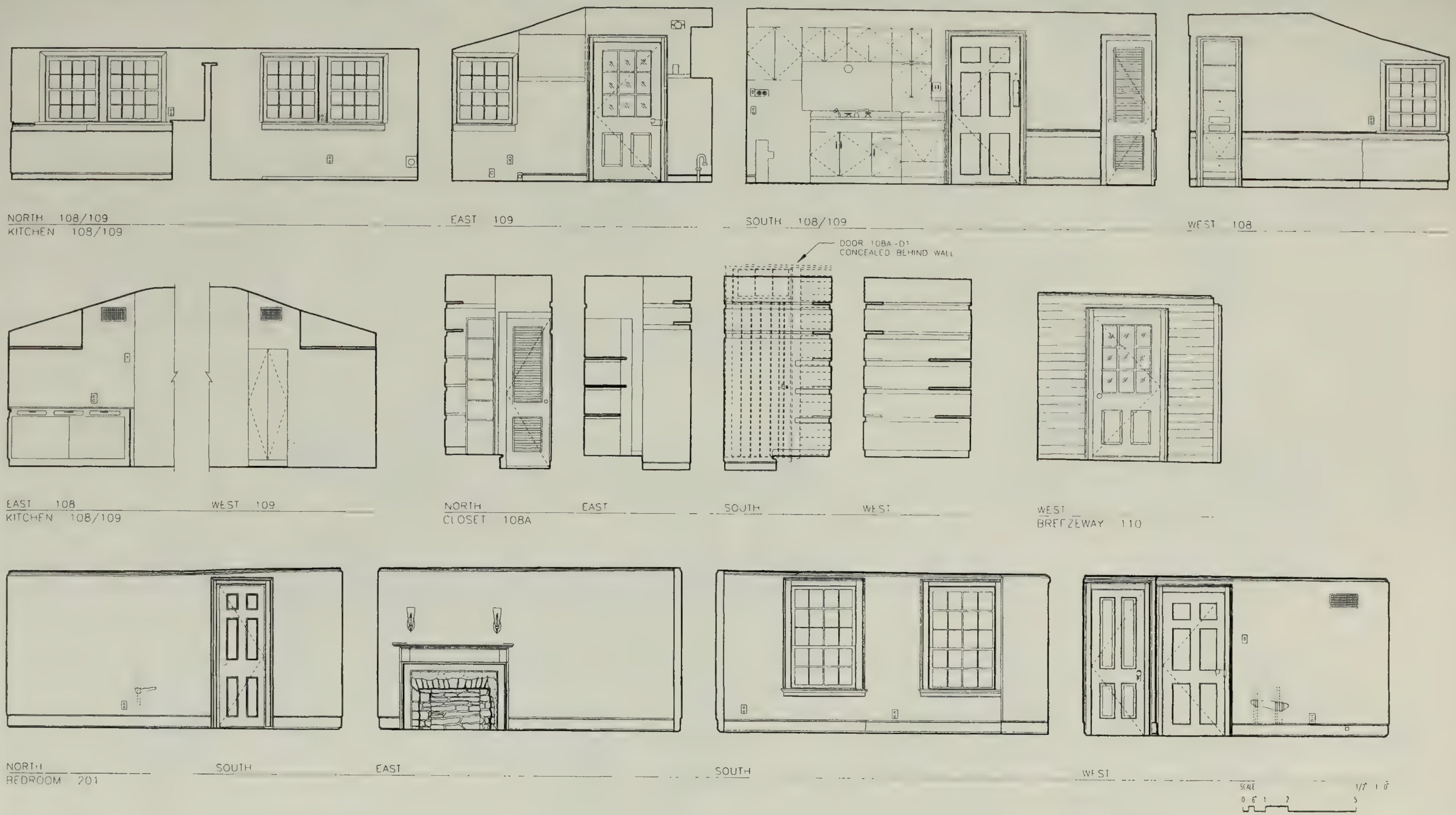
SHEET 22
OF 43


EAST
ENTRY HALL 102 (CONT.)
SOUTH
WEST
NORTH
DINING ROOM 103
EAST
DINING ROOM 103
SOUTH
WEST
NORTH
HALL 104A
EAST
SOUTH
WEST
NORTH
BEDROOM 104
EAST
SCALE
0 .5 1 2 5'
1/2" 1'0"

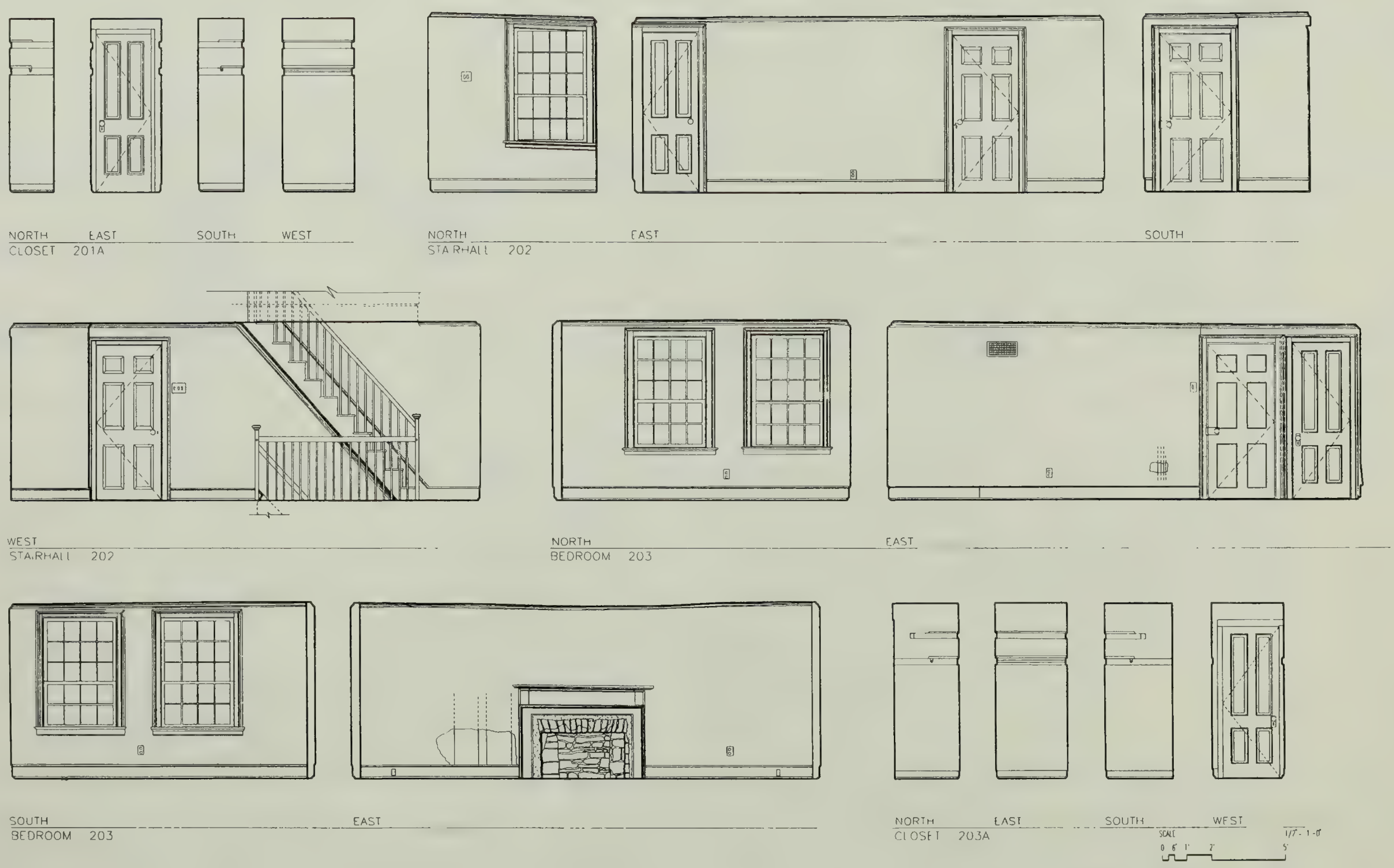
DESIGNED	SHEET TITLE	AUTOCAD FILE MHEXIE04	DRAWING NO 357/80002
DRAWN K R MAROLF TECH REV A W O'BRIGHT DATE JUNE 25, 1992	EXISTING CONDITIONS INTERIOR ELEVATIONS/ROOMS 102-104 MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	SUB SHEET	SHEET 23 OF 43


SOUTH
BEDROOM 104 (CONT.)
WEST
NORTH
CLOSET 104B
EAST
SOUTH
WEST
NORTH
DRESSING ROOM 106
EAST
SOUTH
WEST
NORTH
BATHROOM 107
EAST
SOUTH
WEST
NORTH
CLOSET 107A
EAST
SOUTH
WEST
SCALE
1/2" - 1' 0"
0 6" 1' 2' 5

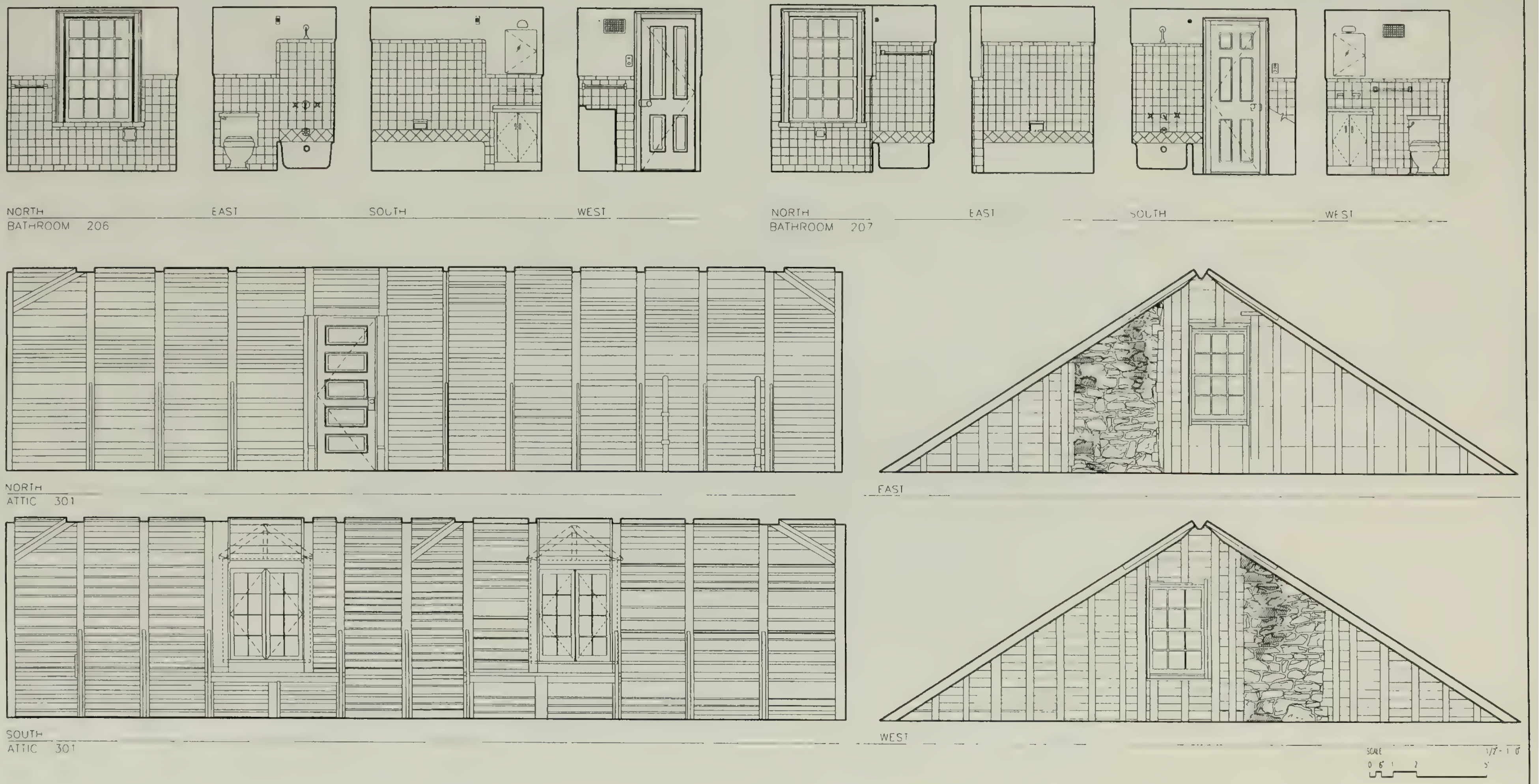
DESIGNED	SHEET TITLE EXISTING CONDITIONS INTERIOR ELEVATIONS/ROOMS 104–107A MAIN HOUSE (HS–1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXIE05	DRAWING NO 357/80002
DRAWN K. R. MAROLF TECH. REV. A. W. O'BRIGHT DATE JUNE 25 1992		SUB SHEET	SHEET 24 OF 43


NORTH 108/109
KITCHEN 108/109
EAST 109
SOUTH 108/109
WEST 108
DOOR 108A-D1
CONCEALED BEHIND WALL
EAST 108
KITCHEN 108/109
WEST 109
NORTH
CLOSET 108A
EAST
SOUTH
WEST
WEST
BREEZEWAY 110
NORTH
BEDROOM 201
SOUTH
EAST
SOUTH
WEST
SCALE
1/2" 1'0"
0 6" 1 2 5

DESIGNED	SHEET TITLE EXISTING CONDITIONS INTERIOR ELEVATIONS/ROOMS 201A-203A MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXIF06	DRAWING NO 357/80002
DRAWN K R MAROLF TECH REV A W O'BRECHT		SUB SHEET	SHEET 25
DATE JUNE 25 1992			OF 43


NORTH
EAST
SOUTH
WEST
CLOSET 201A
NORTH
EAST
SOUTH
STAIRHALL 202
WEST
STAIRHALL 202
NORTH
EAST
BEDROOM 203
SOUTH
EAST
BEDROOM 203
NORTH
EAST
SOUTH
WEST
CLOSET 203A
SCALE
1/2" - 1'-0"
0 6" 1' 2' 5'

DESIGNED	SHEET TITLE	AUTOCAD FILE MHEXIE07	DRAWING NO 357/H0007
DRAWN K. R. NAROLF TECH REV A. W. O'BRIGHT DATE JUNE 25, 1992	EXISTING CONDITIONS INTERIOR ELEVATIONS/ROOMS 201A-203A MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	SUB SHEET	SHEET 26 OF 43


NORTH
BATHROOM 206
EAST
SOUTH
WEST
NORTH
BATHROOM 207
EAST
SOUTH
WEST
NORTH
ATTIC 301
EAST
SOUTH
ATTIC 301
WEST
SCALE
1/2" - 1' 0"
0
6"
1
2
5'

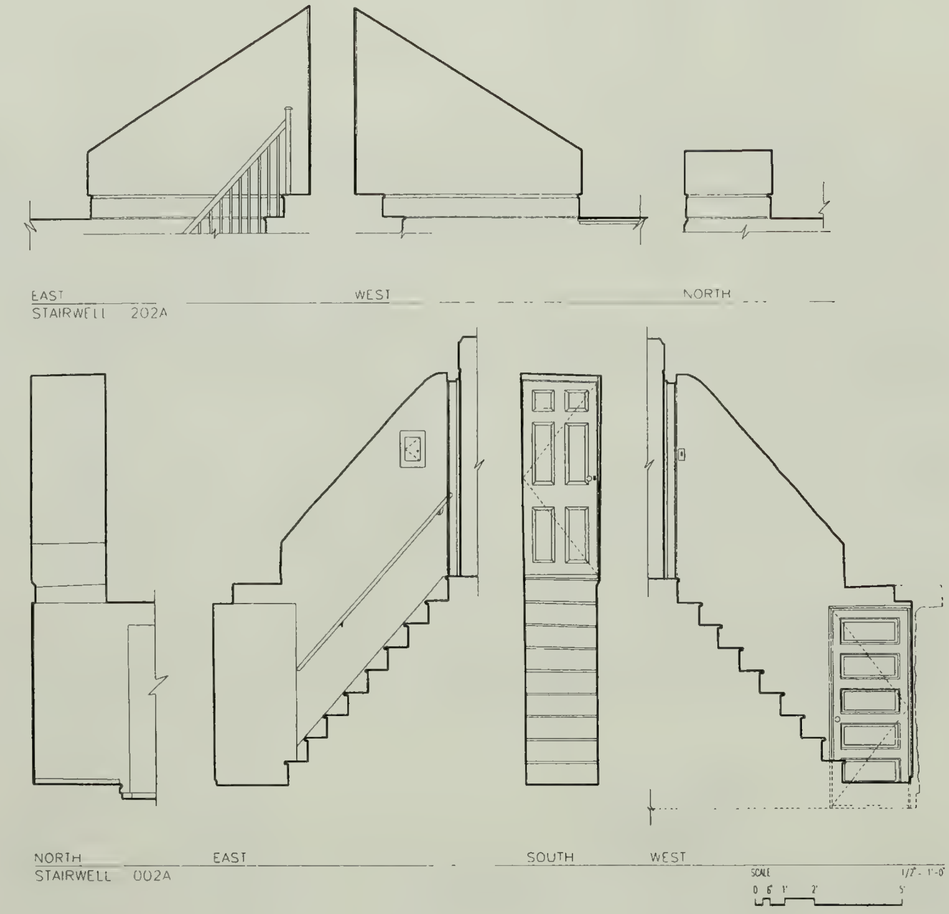
DESIGNED

DRAWN
K R MAROLF
TECH REV
A W O'BRICHT
DATE
JUNE 25 1992

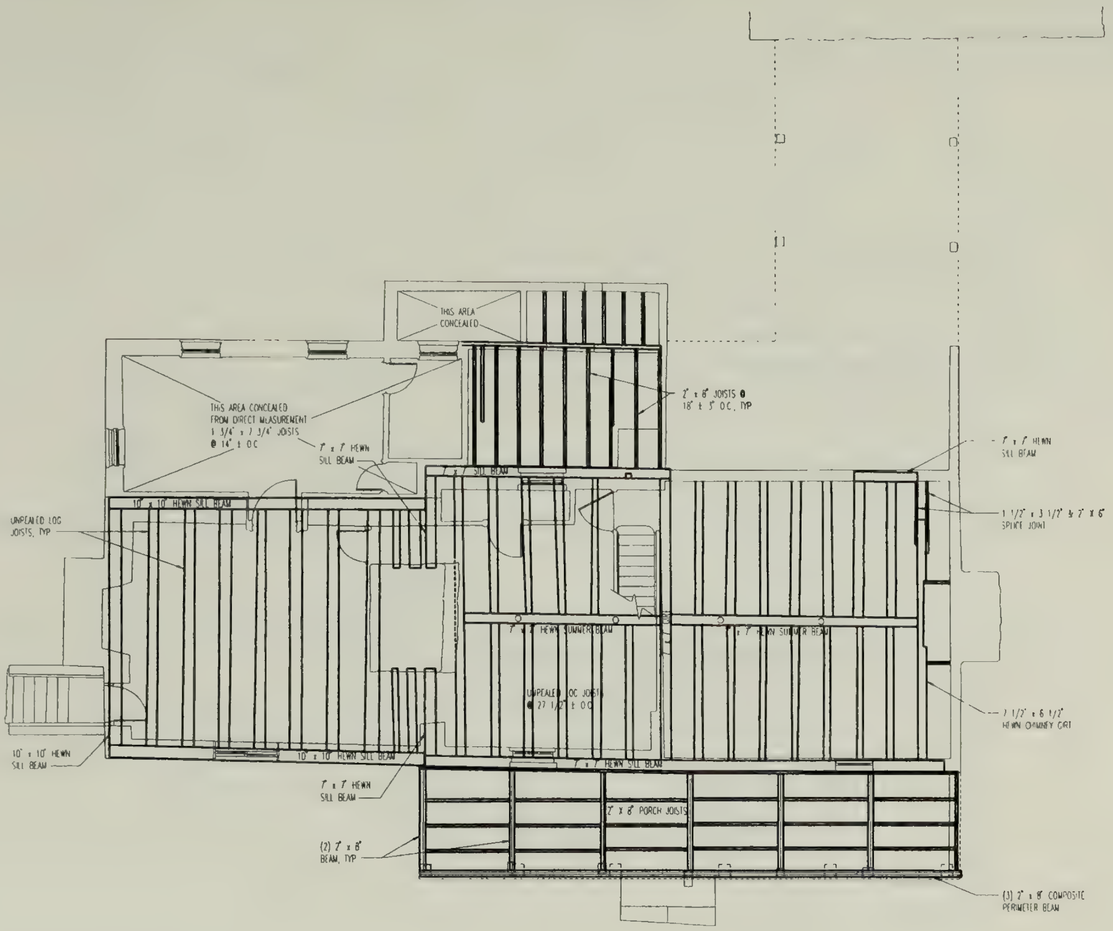
SHEET TITLE
EXISTING CONDITIONS
INTERIOR ELEVATIONS/ROOMS 206-301
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEXIC08
SUB SHEET

DRAWING NO
357/80002
SHEET 27
OF 43


EAST
WEST
NORTH
STAIRWELL 202A
NORTH
EAST
SOUTH
WEST
STAIRWELL 002A
SCALE
0 6" 1' 2' 5'
1/2" - 1'-0"

DESIGNED	SHEET TITLE EXISTING CONDITIONS INTERIOR ELEVATIONS/ROOMS 002A & 202A MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXIE09	DRAWING NO 357/80002
DRAWN K. R. MAROLF TECH REV A. W. O'BRIGHT		SUB SHEET	SHEET 28 OF 43
DATE JUNE 25 1992			

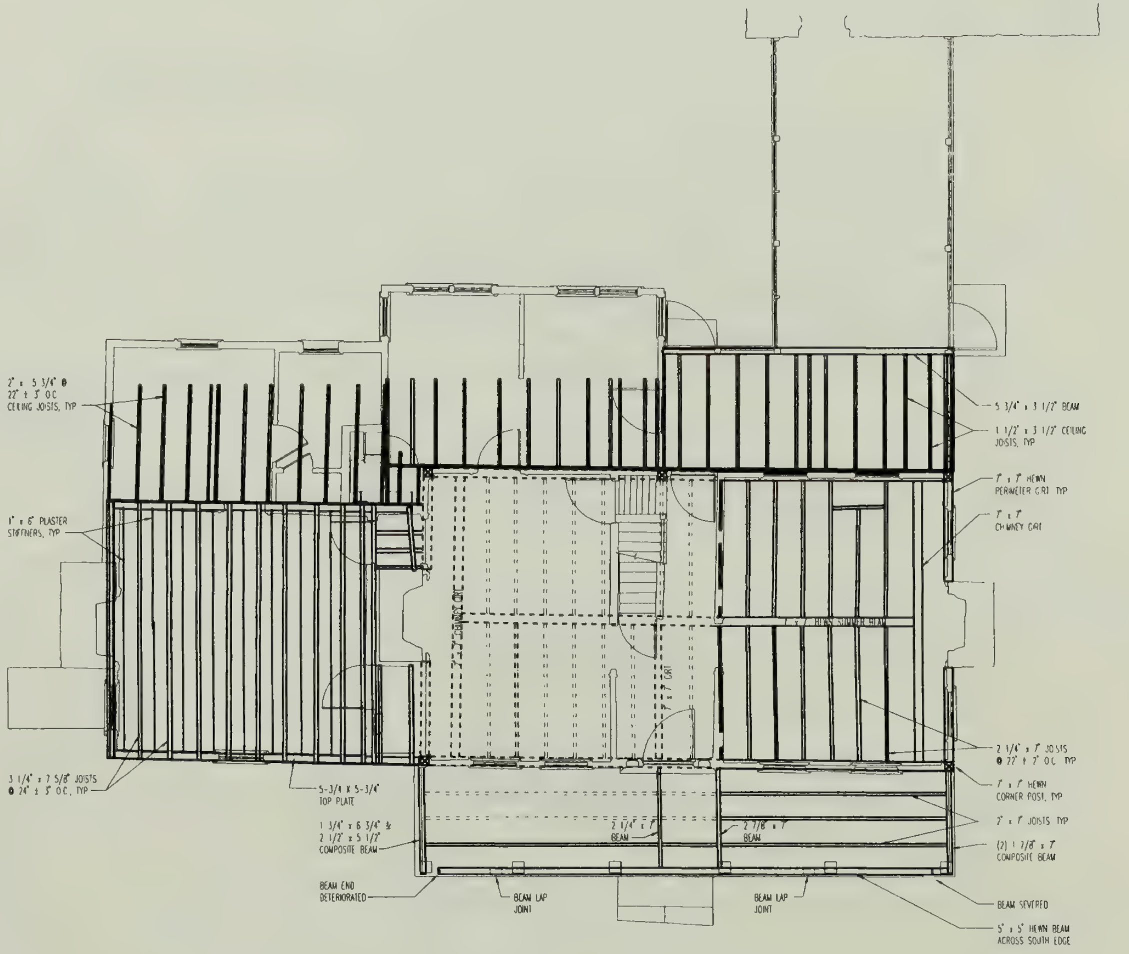

THIS AREA CONCEALED
2" x 8" JOISTS @ 18" ± 3" O.C., TYP
THIS AREA CONCEALED FROM DIRECT MEASUREMENT 1 3/4" x 7 3/4" JOISTS @ 14" ± O.C.
7" x 7" HEWN SILL BEAM
7" x 7" SILL BEAM
7" x 7" HEWN SILL BEAM
10" x 10" HEWN SILL BEAM
UNPEALED LOG JOISTS, TYP
1 1/2" x 3 1/2" & 2" x 6" SPLICE JOINT
7" x 7" HEWN SUMMER BEAM
7" x 7" HEWN SUMMER BEAM
UNPEALED LOG JOISTS @ 27 1/2" ± O.C.
7 1/2" x 6 1/2" HEWN CHIMNEY GIRT
10" x 10" HEWN SILL BEAM
10" x 10" HEWN SILL BEAM
7" x 7" HEWN SILL BEAM
7" x 7" HEWN SILL BEAM
2" x 8" PORCH JOISTS
(2) 2" x 8" BEAM, TYP
(3) 2" x 8" COMPOSITE PERIMETER BEAM

FIRST FLOOR STRUCTURAL FRAMING PLAN

SCALE 1/4" = 1'-0"

0 1 5 10

DESIGNED	SHEET TITLE FIRST FLOOR STRUCTURAL FRAMING PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE WHEXST01	DRAWING NO 357/80002
DRAWN K. R. NAROLF TECH REV A. W. O'BRIGHT		SUB SHEET	SHEET 29 OF 43
DATE JUNE 25, 1992			


2" x 5 3/4" @ 22" ± 3" OC CEILING JOISTS, TYP
1" x 6" PLASTER STIFFNERS, TYP
3 1/4" x 7 5/8" JOISTS @ 24" ± 3" OC, TYP
5-3/4 X 5-3/4" TOP PLATE
1 3/4" x 6 3/4" & 2 1/2" x 5 1/2" COMPOSITE BEAM
BEAM END DETERIORATED
BEAM LAP JOINT
BEAM LAP JOINT
2 1/4" x 7" BEAM
2 7/8" x 7" BEAM
7" x 7" CHIMNEY GRT
7" x 7" GRT
7" x 7" HEWN SUMMER BEAM
5 3/4" x 3 1/2" BEAM
1 1/2" x 3 1/2" CEILING JOISTS, TYP
7" x 7" HEWN PERIMETER GRT TYP
7" x 7" CHIMNEY GRT
2 1/4" x 7" JOISTS @ 22" ± 2" OC TYP
7" x 7" HEWN CORNER POST, TYP
2" x 7" JOISTS TYP
(2) 1 7/8" x 7" COMPOSITE BEAM
BEAM SEVERED
5" x 5" HEWN BEAM ACROSS SOUTH EDGE

KEY

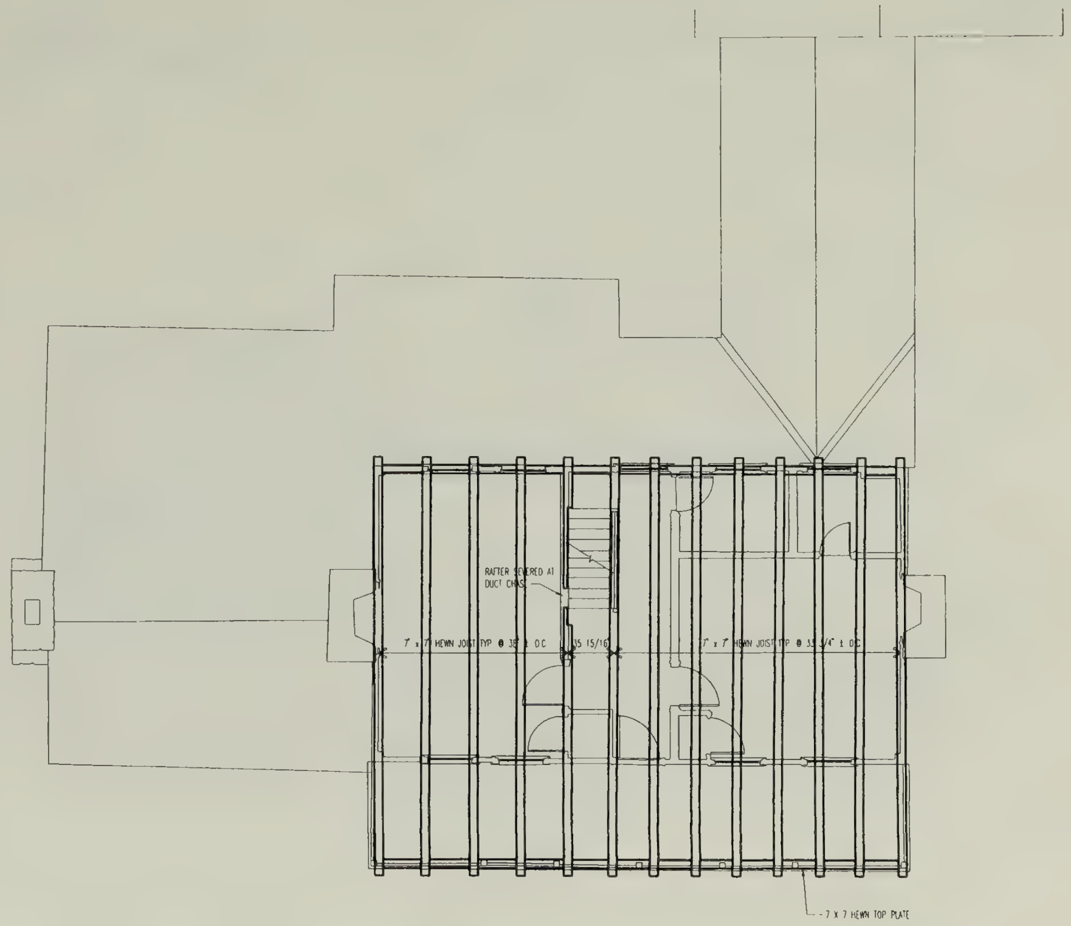
- - ASSUMED LOCATION OF STRUCTURAL MEMBERS

- - - - VERIFIED EXISTENCE OF STRUCTURAL MEMBER EXACT LOCATION

SECOND FLOOR STRUCTURAL FRAMING PLAN

SCALE 1/4" = 1'-0"
0 1 5 10

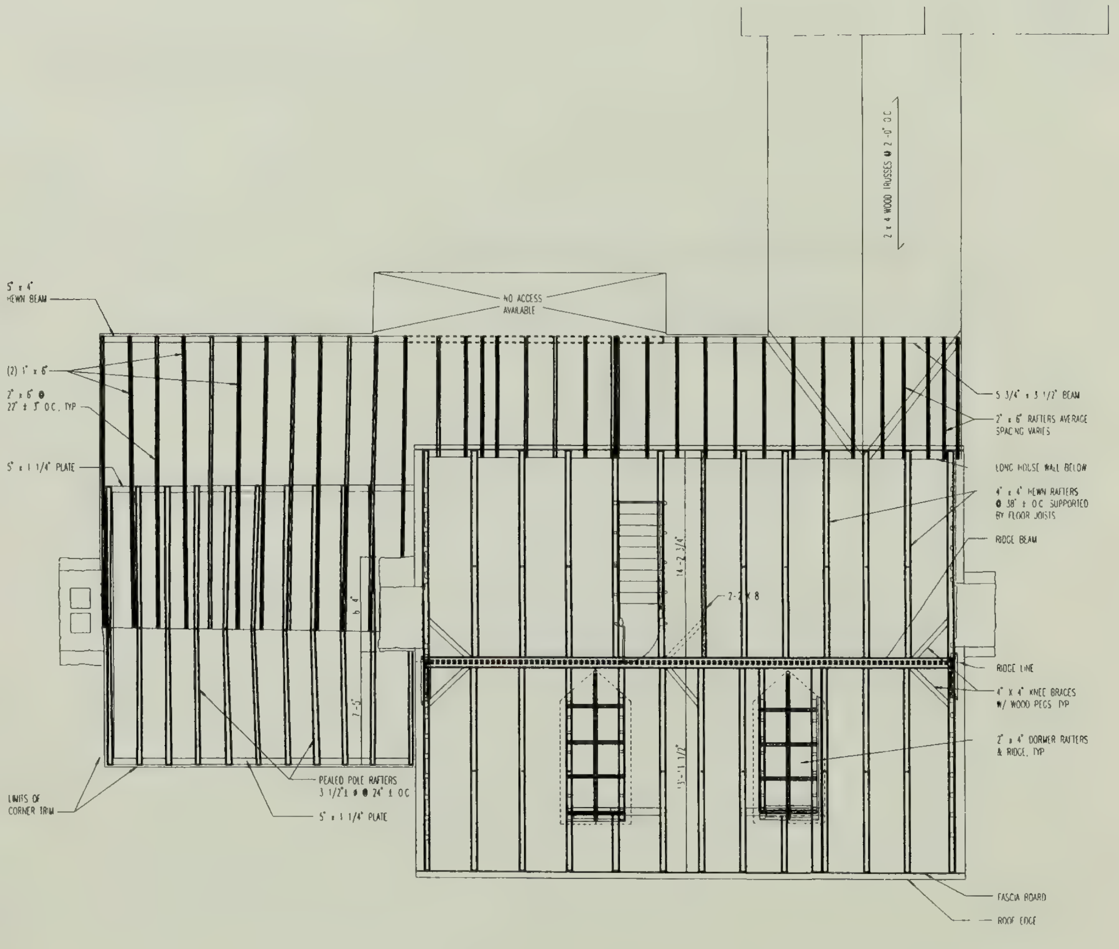
DESIGNED	SHEET TITLE	AUTOCAD FILE MHEXS1J2	DRAWING NO 357/80002
DRAWN K. R. MAROLF TECH REV A. W. O'BRIGHT DATE JUNE 25, 1992	SECOND FLOOR STRUCTURAL FRAMING PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	SUB SHEET	SHEET 30 OF 43


RAFTER SEVERED AT
DUCT CHASE
7" x 7" HEWN JOIST TYP @ 35" ± O C
35 15/16"
7" x 7" HEWN JOIST TYP @ 35 3/4" ± O C
7 X 7 HEWN TOP PLATE

ATTIC FLOOR STRUCTURAL FRAMING PLAN

SCALE 1/4" 1'-0"
0 1 5 10

DESIGNED	SHEET TITLE	AUTOCAD FILE MHEXSTJ3	DRAWING NO 357/80002
DRAWN K R MAROLF TECH REV A W O'BRIGHT DATE JUNE 25, 1992	ATTIC FLOOR STRUCTURAL FRAMING PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	SUB SHEET	SHEET 31 OF 43


2 x 4 WOOD TRUSSES @ 2'-0" O.C.
NO ACCESS AVAILABLE
5" x 4" HEWN BEAM
(2) 1" x 6"
2" x 6" @ 22" ± 3" O.C. TYP
5" x 1 1/4" PLATE
LIMITS OF CORNER TRIM
PEALED POLE RAFTERS 3 1/2"± ⌀ @ 24" ± O.C.
5" x 1 1/4" PLATE
6'-4"
7'-5"
14'-2 3/4"
15'-1 1/2"
2-2 X 8
5 3/4" x 3 1/2" BEAM
2" x 6" RAFTERS AVERAGE SPACING VARIES
LONG HOUSE WALL BELOW
4" x 4" HEWN RAFTERS @ 38" ± O.C. SUPPORTED BY FLOOR JOISTS
RIDGE BEAM
RIDGE LINE
4" X 4" KNEE BRACES W/ WOOD PEGS TYP
2" x 4" DORMER RAFTERS & RIDGE, TYP
FASCIA BOARD
ROOF EDGE

KEY

ASSUMED LOCATION OF STRUCTURAL MEMBERS

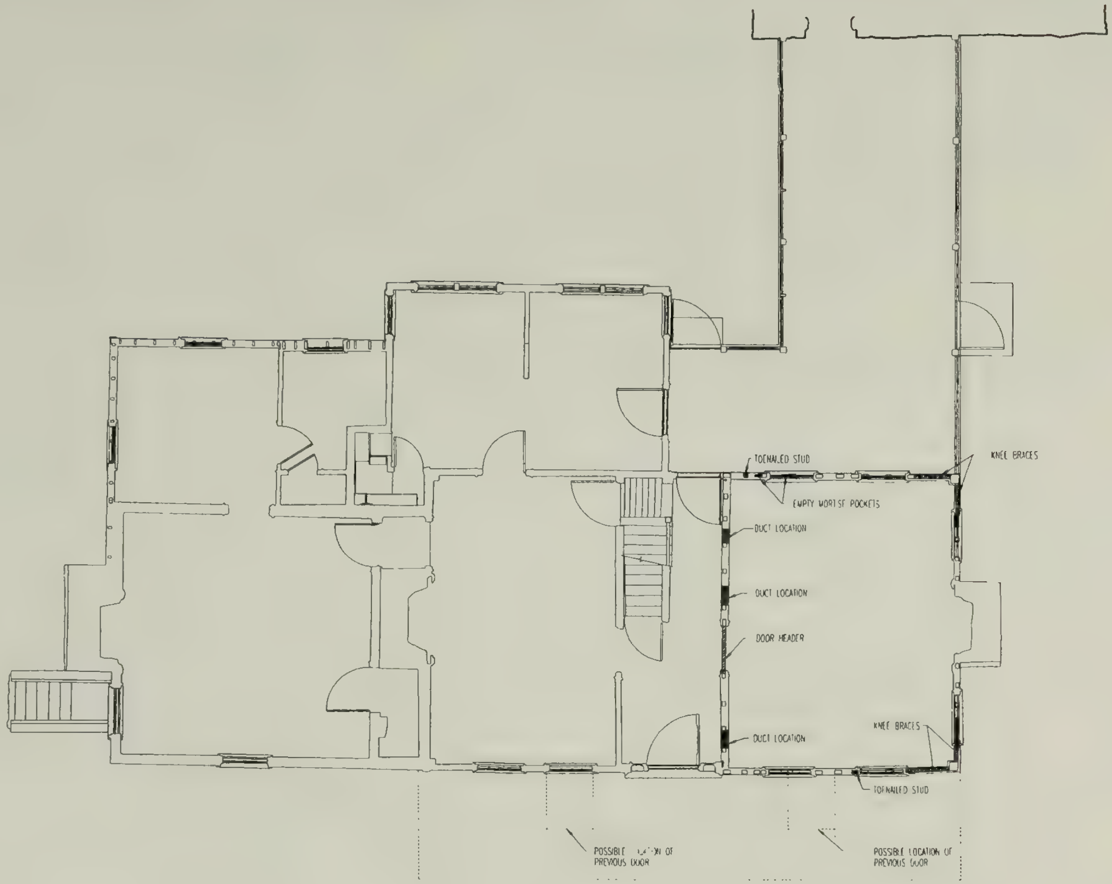
- - - - VERIFIED EXISTENCE OF STRUCTURAL MEMBER EXACT LOCATION

RAFTER FRAMING PLAN

SCALE 1/4" = 1'-0"

0 1 5 10

DESIGNED	SHEET TITLE	AUTOCAD FILE MHEXSTR1	DRAWING NO 357/80002
DRAWN K. R. MAROLF TECH REV A. W. O'BRIGHT DATE JUNE 25, 1992	RAFTER FRAMING PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	SUB SHEET	SHEET 32 OF 43


TOENAILED STUD
EMPTY MORTISE POCKETS
KNEE BRACES
DUCT LOCATION
DUCT LOCATION
DOOR HEADER
DUCT LOCATION
KNEE BRACES
TOENAILED STUD
POSSIBLE LOCATION OF PREVIOUS DOOR
POSSIBLE LOCATION OF PREVIOUS DOOR

NOTE
THE SOUTH FACE OF THE STUDS ON THE SOUTH WALL IN ROOM 101 LINE UP WITH THE SOUTH FACE OF THE PERIMETER BEAM BUT THE STUDS ARE IN A TILTED POSITION WITH THE BOTTOM OF THE STUDS RESTING FURTHER SOUTH THAN THE TOP THIS EXPLAINS WHY THE SOUTH WALL DOES NOT MATCH UP WITH THE SOUTH PERIMETER BEAM IN PLAN

FIRST FLOOR STUD PLAN

SCALE 1/4" = 1'-0"
0 1 5 10

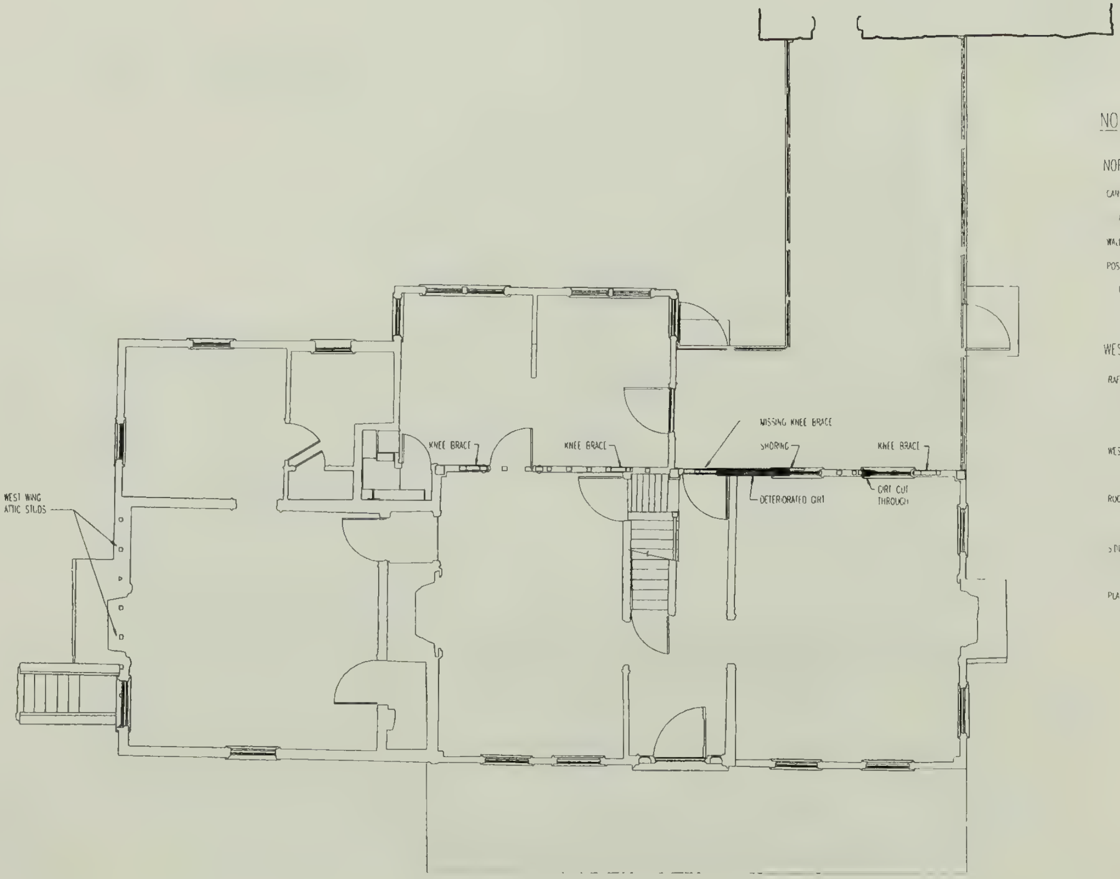
DESIGNED

DRAWN
K. R. MAROLF
TECH REV
A. W. O'BRIGHT
DATE
JUNE 25, 1992

SHEET TITLE
FIRST FLOOR STUD PLAN
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEXSTS1
SUB SHEET

DRAWING NO.
357/80002
SHEET 33
OF 43


WEST WING
ATTIC STUDS
KNEE BRACE
KNEE BRACE
MISSING KNEE BRACE
SHORING
KNEE BRACE
DETERIORATED GIRT
GIRT CUT
THROUGH

NOTES

NORTH WALL OF MAINHOUSE

CAN SEE TOP OF OLD SECOND FLOOR,
APPEARS TO BE QUITE SAGGED OUT
WALL STRUCTURE NORTH IS 5" DEEP
POST CASING @ 1-1/2" TO 1 3/4"
DEEP FROM SURFACE OF CORNER POST

WEST WING

RAFTERS ARE 2 1/2" TO 3" DIAMETER @
THE RIDGE 3-1/2" TO 4" SQUARED OFF
@ THE BASE
WEST WALL CAVITY FROM BACKSIDE OF SIDING TO
WEST SURFACE OF THE FIRST JOIST IS 1-3/4"
ROOF SHEATHING IS 1" x 4" WITH 2" TO 2 1/2"
SPACING VERTICAL SAWN
SIDING IS 1" x 7-1/2" AND IS VERTICAL SAWN/
SET WITH CUT NAILS
PLATE ON NORTH WALL IS 6" TO 6 1/2" WIDE

SECOND FLOOR STUD PLAN

SCALE 1/4" - 1' 0"
0 1 5 10

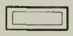
DESIGNED	SHEET TITLE SECOND FLOOR STUD PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE WHEXS1S2	DRAWING NO 357/80002
DRAWN K. R. MAROLT TECH REV A. W. O'BRICHI		SUB SHEET	SHEET 34 OF 43
DATE JUNE 25 1992			

MARK	WINDOW												
	TYPE	FIN OPNG.		DETAILS					19TH CENT INTEGRITY				NOTES
		WIDTH	HEIGHT	SILL	MEETING RAIL	JAMB	HEAD	MULLION	SASH	FRAME	INTERIOR CASING	EXTERIOR CASING	
001-W1	A	24 7/8"	3 3/8"	•1		•2	•3		–	–	–		
002-W2	B	34"	15 7/8"	4		5	6		–	–	–	–	
002B-W1	B	33 3/4"	15 5/8"	•4		•5	•6		–	–	–	–	
003-W1	C	49 1/8"	30 3/4"	•7	•8	•9	•10		●	●	–		
005-W1	D	29 7/8"	38 1/8"	•11	•12	•13	•14		–	–	–	–	
005 W2	E	49 1/2"	28 5/8"	11		13	14		–	–	–	–	
005-W3	E	29 3/4"	28 5/8"	11		13	14		–	–	–	–	
006-W1	E	29 3/8"	28 5/8"	11		13	14		–	–	–		
101-W1	F	35 7/8"	55 3/4"	•15	•16	•17	•18		●	●	–	●	FRAME FURRING MAY BE CUT FROM HISTORIC MILLWORK
101-W2	F	36"	55 3/8"	•19	16	•20	•21		●	●	●	●	
101-W3	F	36 1/8"	55 1/2"	19	16	20	21		●	●	●	●	
101-W4	F	36 1/2"	55 3/8"	•22	•23	•24	•25		–	–	–	–	
101-W5	F	36 1/2"	55 3/8"	22	23	24	25		–	–	–		
101-W6	F	36"	55 1/2"	15	16	17	18		●	●	–	●	EXTERIOR BACKBAND NON HISTORIC
102-W1	SEE DOOR SCH	10"	54 3/4"	SEE DOOR ELEVATIONS	SEE DOOR ELEVATIONS	SEE DOOR ELEVATIONS	SEE DOOR ELEVATIONS		●	●	●	●	
102-W2	SEE DOOR SCH	9 7/8"	54 3/4"	SEE DOOR ELEVATIONS	SEE DOOR ELEVATIONS	SEE DOOR ELEVATIONS	SEE DOOR ELEVATIONS		●	●	●	●	
102 W3	SEE DOOR SCH	68 3/8"	17 1/4"	SEE DOOR ELEVATIONS	SEE DOOR ELEVATIONS	SEE DOOR ELEVATIONS	SEE DOOR ELEVATIONS		●	●	●	●	
103-W1	F	35 7/8"	55 1/2"	19	16	20	21		●	●	●	●	
103 W2	F	36"	55 1/4"	19	16	20	21		●	●	●	●	
104-W1	F	36 1/2"	55 1/4"	26	27	28	29		●	●	●	●	
104-W2	F	36 3/8"	55 1/8"	•26	•27	•28	•29		●	●	●	●	
106-W1	F	29 3/4"	44 5/8"	•30	23	•31	•32		–	–	–		
106-W2	F	29 3/4"	44 3/4"	30	23	31	32			–	–	–	
107-W1	F	30"	44 3/8"	•33	23	31	32		–	–	–	–	
108-W1	G	30 1/2"	38 3/8"	35		37	38		–	–	–	–	
108-W2	H	64 1/4"	38 1/4"	35		37	38	34	–	–	–	–	
108A-W1	SEE DOOR SCH	37"	17 7/8"	SEE DOOR ELEVATIONS		SEE DOOR ELEVATIONS	SEE DOOR ELEVATIONS		●	●	U	●	
109-W1	H	64"	37 5/8"	35		37	38	•34	–	–	–	–	
109-W2	G	30"	37 5/8"	35		37	38	34	–	–	–	–	
201-W1	F	36"	55 1/2"	•39	23	•40	•41		–	●	●	●	
201-W2	F	36"	55 5/8"	•42	16	•43	•44		●	–	–	–	SASH MOVED FROM 1940 HABS ROOM 4 NORTH WINDOW
202-W1	F	36 1/16"	55 3/4"	39	23	40	41		–	●	●	●	
203-W1	F	36"	55 1/2"	39	23	40	41		–	–			
203-W2	F	35 13/16"	55 5/8"	•45	23	•46	•47		–	–	–	–	
203 W3	F	36"	55 5/8"	39	23	40	41		–	●	●	●	
203-W4	F	36 1/16"	55 3/4"	45	23	46	47		–	–	–	–	
206-W1	F	36"	55 5/8"	•48	16	43	44		–	●	–	●	WINDOW INSTALLED 1940; FORMER LOCATION OF HISTORIC ELEMENTS UNKNOWN
207-W1	F	36"	55 3/4"	48	16	•49	•50		•/U	●	●	●	
301 W1	I	28 1/8"	45 1/4"	51	16	52	53		●	●	–	●	
301 W2	I	28 1/4"	45 3/8"	•51	16	•52	•53		●	●	–	●	
301-W3	J	36"	47 1/8"	•54	•55	•56	•57		–	–	–	–	
301-W4	J	36"	47 7/8"	54	55	56	57		–	–	–	–	

• DETAIL TAKEN AT THIS WINDOW

● 19TH CENTURY INTEGRITY

WINDOW TYPES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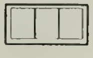
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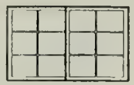
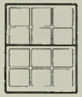
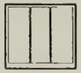
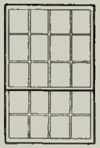

TYPE C


TYPE D


TYPE E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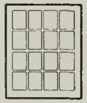
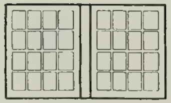
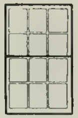
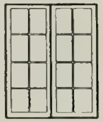

TYPE G


TYPE H


TYPE I


TYPE J

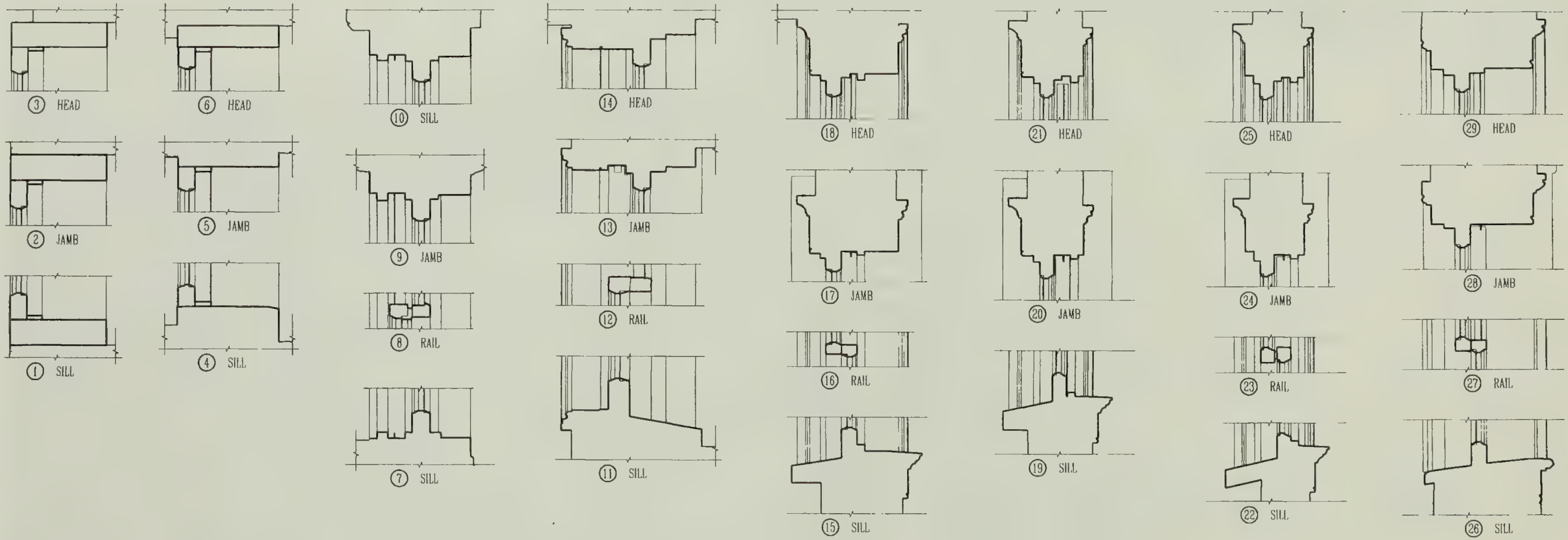
DESIGNED

DRAWN
L M JOHNSON
TECH REV
A W O'BRIGHT
DATE
JUNE 25, 1992

SHEET TITLE
EXISTING CONDITIONS
WINDOW SCHEDULE AND ELEVATIONS
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

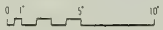
AUTOCAD FILE
WHCXSCWN
SUB SHEET

DRAWING NO
357/80002
SHEET 35
OF 43


① SILL
② JAMB
③ HEAD
④ SILL
⑤ JAMB
⑥ HEAD
⑦ SILL
⑧ RAIL
⑨ JAMB
⑩ SILL
⑪ SILL
⑫ RAIL
⑬ JAMB
⑭ HEAD
⑮ SILL
⑯ RAIL
⑰ JAMB
⑱ HEAD
⑲ SILL
⑳ JAMB
㉑ HEAD
㉒ SILL
㉓ RAIL
㉔ JAMB
㉕ HEAD
㉖ SILL
㉗ RAIL
㉘ JAMB
㉙ HEAD

EXISTING WINDOW DETAILS

SCALE 3" - 1' 0"



DESIGNED

DRAWN
L M JOHNSON

TECH REV
A W OBRCHI

DATE
JUNE 25, 1992

SHEET TITLE

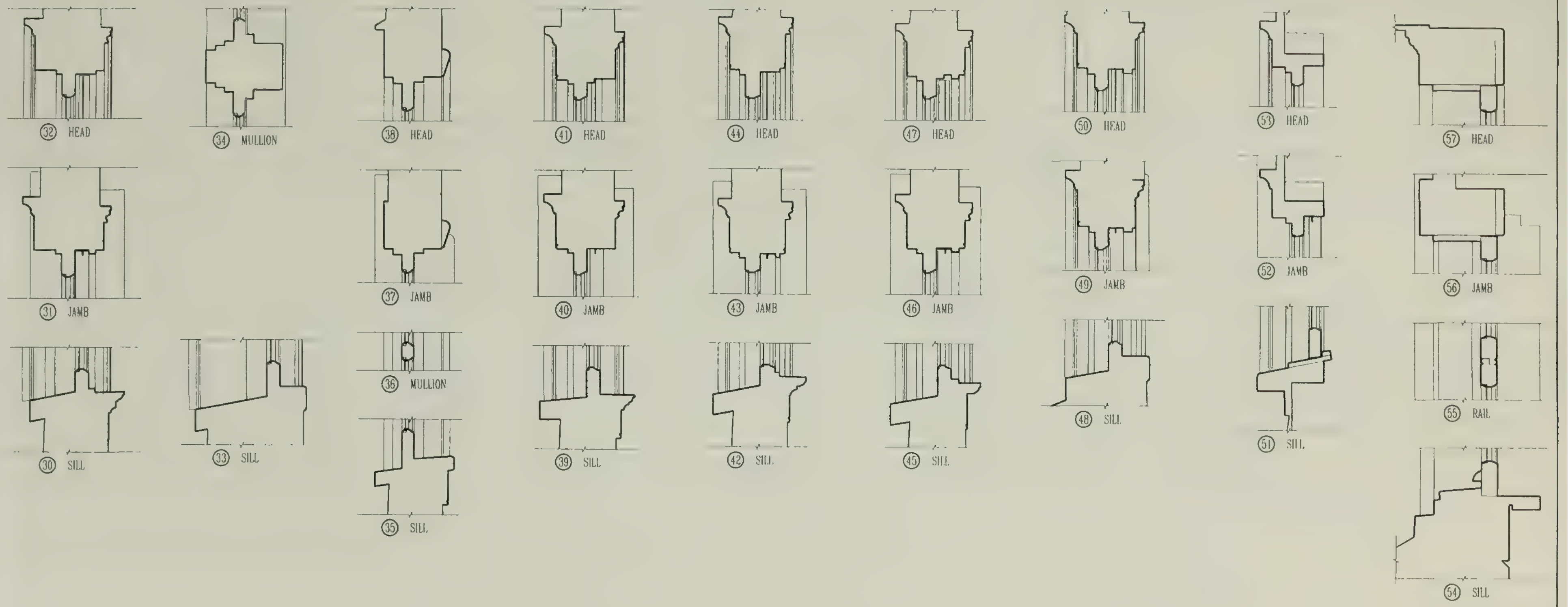
EXISTING WINDOW DETAILS
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEXWD01

SUB SHEET

DRAWING NO
357/80002

SHEET 36
OF 43


32 HEAD
34 MULLION
38 HEAD
41 HEAD
44 HEAD
47 HEAD
50 HEAD
53 HEAD
57 HEAD
31 JAMB
37 JAMB
40 JAMB
43 JAMB
46 JAMB
49 JAMB
52 JAMB
56 JAMB
36 MULLION
55 RAIL
30 SILL
33 SILL
39 SILL
42 SILL
45 SILL
48 SILL
51 SILL
35 SILL
54 SILL

EXISTING WINDOW DETAILS

SCALE 3" = 1'-0"

0 1" 5" 10"

DESIGNED	SHEET TITLE	AUTOCAD FILE MHEXWD02	DRAWING NO 357/80002
DRAWN M JOHNSON TECH REV A. W. O'BRIGHT	EXISTING WINDOW DETAILS MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	SUB SHEET	SHEET 37
DATE JUNE 25, 1992			OF 43

MARK	DOOR										FRAME & CASING													
	TYPE		DIMENSION			MATERIAL					OPENING		MATERIAL					DETAIL			19TH CENTURY INTEGRITY		
		PANELS	HEIGHT	WIDTH	DEPTH	MAPLE	PINE	FIR	FINISH	19TH CENT INTEGRITY	HEIGHT	WIDTH	OAK	MAPLE	PINE	FIR	FINISH	SILL	JAMB	HEAD	FRAME	LEFT CASING	RIGHT CASING
002-D1	A	5	79 1/4	31 7/8	1 3/8	U			P		80	32 1/8					P	•1	•2	•3		–	–
002-D2	B	4	75 5/8	27 7/8	1 1/2		●		P		76 1/8	28			●		P		•4	•5			
003-D1	M	3	70 3/4	28 5/8	1 3/8				P	U	71 1/4	28 3/4			●		P	•6	•7	•8			
003-D2	C	–	72 3/4	24 7/8	3/4		●		V		73 3/8	24 3/4			●		V	•9	•10	•11			
003-D3	C	–	68 3/4	30 3/8	3/4		●		V		69 1/8	30			●		V		•12	•13			
005-D1	D	6	78	36	1 1/2		●		P	●	78 3/4	36			●		P		•14	•15			
005-D2	E	6	79	23 1/4	1 3/8		●		P		79 1/2	23 1/4			●		P		•16	•17			
006-D1	F	6	79	24	1 3/8		●		P		79 5/8	23 7/8			●		P		•18	•19			
101-D1	NONE	–							–	–	78 3/4	36					P		•20	•21	●		●
102-D1	F	1	76 1/4	42 3/4	2		●		P	●	76 1/2	43					P	SEE SHEET ?			●	●	●
102-D2	D	6	79 1/4	36	1 1/2		●		P	●	79 3/8	36 1/8			●		P	•22	•23	•24	●	●	●
102-D3	G	6	78 9/16	31 1/8	1 3/16		U		P	●	80	31 3/8			●		P	•25	•26	•27	●	●	●
103 D1	MISSING	–			1 1/8					-	79 1/2	36 1/4			U		P		•28	•29	●	●	●
103-D2	G	6	78 1/2	35	1 3/16		U		P	●	79 3/8	35 1/4			U		P	•30	•31	•32	●	●	●
103-D3	MISSING	–							–	–	82 3/4	36 5/8			U		P	•33	•34	•35	●	●	●
103-D4	G	6	79 1/2	35	1 1/8				P	●	80 3/8	35 3/4					P	•36	•37	•38		●	
104-D1	H	6	79 3/4	34 3/4	1 5/16		U		P	●	81 1/2	35			U		P		•39	•40	●	●	●
104-D2	I	6	82 3/8	36 1/4	1 1/4		U		P	●	83	36 5/8			U		P		•41	•42	●	●	
104-D3	MISSING	-							–	–	79 3/4	33 7/8			U		P		•43	•44	●	●	●
107-D1	E	6	78 3/8	30 1/8	1 3/8		●		P		78 7/8	30 1/4	●				P	•45	•46	•47			
107-D2	J	–	78 5/8	24 1/8	1 3/8		●		P		79 1/4	24 1/4			●		P	•48	•49	•50			
108-D1	J		78 3/4	23 7/8	1 3/8		●		P		80	24	U				P		•51	•52			
108A-D1	P	–	82	31 1/4	7/8				P	●	82 1/4	32 1/4					P	•53	•54	•55	●	●	●
109-D1	K	2	74 3/4	35 1/2	1 3/8		●		P	●	75 1/4	36 1/4			●		P	•58	•59	•60			
201-D1	G	6	75 3/8	32 5/8	1 1/8		●		P	●	76 3/8	32 3/4			●		P		•61	•62	●	●	●
201-D2	B	4	76 7/8	28	1 3/8		●		P		77 1/8	28 1/8			●		P		•63	•64			
202-D1	G	6	75 1/2	34	1 1/2		●		P	●	75 5/8	34 1/8			●		P	•65	•66	•67	●	●	●
203-D1	G	6	75 1/2	32 5/8	1 1/4		●		P	●	76 1/8	32 3/4			●		P		•28	•29	●	●	●
203-D2	B	4	75 11/16	28	1 7/16		●		P		76 1/8	28 1/8			●		P		•68	•69			
206 D1	B	4	77 3/16	27 3/4	1 3/8		●		P		77 1/2	28 1/8	●				P	•70	•71	•72			
207-D1	L	6	75 1/4	25 3/16	1 1/8		●		P		75 7/8	25 1/4			?		P	•73	•74	•75			
301-D1	A	5	77 3/4	30	1 3/8		●		P		77 7/8	30 1/4			●		P/	•76	•77	•78			
STONE BUILDING																							
D1	N	9	83	35 5/8	1 1/4		●		P	●	83 1/4	36 1/8			●		P	•–	•–	•–			
D2	G	6	79 1/2	31 13/16	1 3/8			●	P/V		80 1/8	32			●		P	•–	•–	•–			
D3	O	4	80 1/2	33 3/4	1 3/8		●		P	●	?	34			●		P	•–	•–	•–		—	—

MARK	LOCKSET												KNOBS											
	TYPE			SIZE			MATERIAL			SCREW			TYPE		MATERIALS					FINISH		COLOR		
	RIM	MORTISE	DEAD BOLT	HEIGHT	WIDTH	DEPTH	IRON	STEEL	BRASS	POINT	UNPOINT	19TH CENT INTEGRITY	KNOB	LEVER	PORCELAIN	GLASS	BRASS	STEEL	IRON	GLAZE	PLATE	WHITE	BLACK	BROWN
002-D1		●					●		●				•/•		•/			/•		•/	/•		•/	
002-D2	●			3	4 7/8	3/4	●					U	●		●					●		●		
003-D1	●			3	4 7/8	3/4	●					U	●		●					●			•/	/•
003-D2	●			3 1/4	4 1/4	3/4	●					U	●		●					●				●
003-D3	●			3 1/4	4 1/4	3/4	●					U	●		●					●				●
005-D1	●			3 1/4	4 1/4	3/4	●					U	●		●					●		●		
005-D2	●			3 1/8	4 1/4	5/8	●					U	●		●					●		●		
006-D1	●			3 1/8	4 1/4	5/8	●					U	●		●					●		●		
101-D1												–												
102-D1		●							●				●				●				●			
102-D2		●	●						●				●				●				●			
102-D3	●			3 5/8	5 1/4	7/8	●					●	●		●					●		●		
103 D1	●																							
103-D2	●			4 3/8	6	1	●					●		●					●		●			
103-D3												-												
103-D4												–												
104-D1	●			3 1/2	5	7/8	●					●	•/•		•/		/•			•/	/•	•/		
104-D2	●			5	3 5/8	3/4	●					●	●		●					●		•/		/•
104-D3	●			5 1/4	?	?	●					●	NA											
107-D1	●			3 3/4	3 1/4	5/8	●						●		●					●		•/	/•	
107-D2		OTHER						●										●			●			
108-D1		NONE											●		●					•/		•/		
108A-D1	●			3 1/2	5 1/16	3/4	●			●		●	•/U		●					/•		/•		
109-D1	●			3 1/4	4 1/4	3/4	●					●	●				●				●			
201-D1	●			3 3/8	4 1/4	7/8	●					●	●		●					●		●		
201-D2		●						●					●					●			●			
202-D1	●			3 1/2	5 1/4	3/4	●					●	●		●					●		●		
203-D1	●			3 1/2	5 1/8	7/8	●					●	●		●					●		●		
203-D2		●						●					●					●			●			
206 D1	●			3	4 7/8	3/4	●						●		●					●		●		
207-D1	●			3 1/4	4 5/16	7/16	●					U	●		●					●		●		
301-D1		●						●					●					●			●			
STONE BUILDING																								
D1	●			[illegible] 7/8	3 1/4	5/8	●					●	●		●					●		●		
D2		●	●					●	●				•/•				•/	/•			●			
D3	●			5	3 5/8	5/8	●					●	/•		/•					•/		•/		

MARK	HINGES												NOTES
	TYPE	MATERIAL			SIZE				SCREWS				
		CAST IRON	STEEL	BRASS	HEIGHT	WIDTH	KNUCKLES	PIN TYPE	STYLE POINT	STYLE UNPT	NO	19TH CENT INTEGRITY	
002-D1	BUTT		●		3	3	5				6		
002-D2	BUTT		●		3	3	5				6		
003-D1	BUTT	●			2 1/2	4	5				8		
003-D2	BUTT		●		2	3	5				6		
003-D3	BUTT		●		2	3	5				6		
005-D1	BUTT			●	5	3	5				8		
005-D2	BUTT		●		3 1/2	3	5				6		PREVIOUS LOCATION OF DOOR LEAF IS UNKNOWN
006-D1	BUTT		●		3 1/2	3	5				6		
101-D1											-		
102-D1	BUTT	●			4 1/8	4 1/2	5				10	●	
102-D2	BUTT	●			4	2 3/4	5				8	●	EXTERIOR BACKBAND ADDED 1940
102-D3	BUTT	●			4 1/4	2 5/8	5				8	●	
103 D1	BUTT				5 1/8	2 1/4					U	–	
103-D2	BUTT	●			4	2 1/4	5				8	●	
103-D3	BUTT				3 1/2	?					U	–	
103-D4	SWING										U	–	DOOR LEAF FROM 103-01 LEFT CASING FROM 1940 HABS RM 4
104-D1	BUTT	●			4 3/8	2	5				10	●	
104-D2	BUTT	●			4 3/8	2 1/4	5				10	●	
104-D3	BUTT				4	2	?				8		ONLY LOCKSET KEEPER REMAINS
107-D1	BUTT				4	3	5						
107-D2	BUTT				4	3	5				8		
108-D1	BUTT		●		4	4	5				8		
108A-D1	BUTT				3	3/4	5		●		6	●	
109-D1	BUTT		●		4	2 1/2	5				8		
201-D1	BUTT	●			4	3	5				8	●	
201-D2	BUTT		●		2 7/8	3	5				6		
202-D1	BUTT	●			4	2 1/2	5				8	●	
203-D1	BUTT		●		4	2 5/8	5				8	●	
203-D2	BUTT		●		3	2 1/2	3				6		
206 D1	BUTT		●		4	3 1/2	5				8		
207-D1	BUTT		●		2 1/2	2 1/4	3				6		
301-D1	BUTT		●		4	3 1/2	5				8		
STONE BUILDING													
D1	BUTT		●		3 1/2	3	5				6		
D2	BUTT		●		3 1/2	3	5				6		
D3	BUTT		●		3 1/2	?	5						DOOR SALVAGED FROM 104-03 OPENING

P -PAINTED
V -VARNISH
N -NOT FINISHED
U -UNKOWN

N/S W/E

DESIGNED

DRAWN
K R MAROLF

TECH REV
A W O'BRIGHT

DATE
JUNE 25 1992

SHEET TITLE

EXISTING CONDITIONS/DOOR SCHEDULE
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

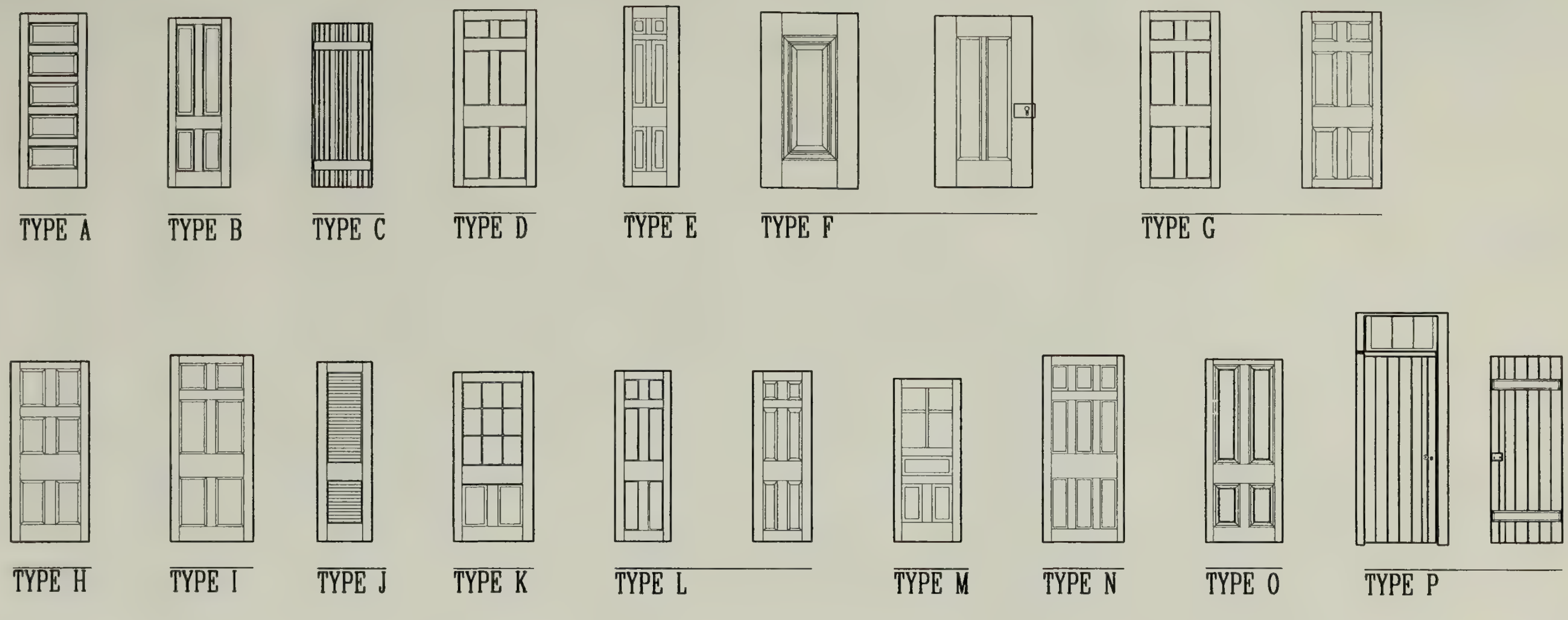
AUTOCAD FILE
MHEXSCDR

SUB SHEET

DRAWING NO
357/80002

SHEET 38
OF 43

DOOR TYPES

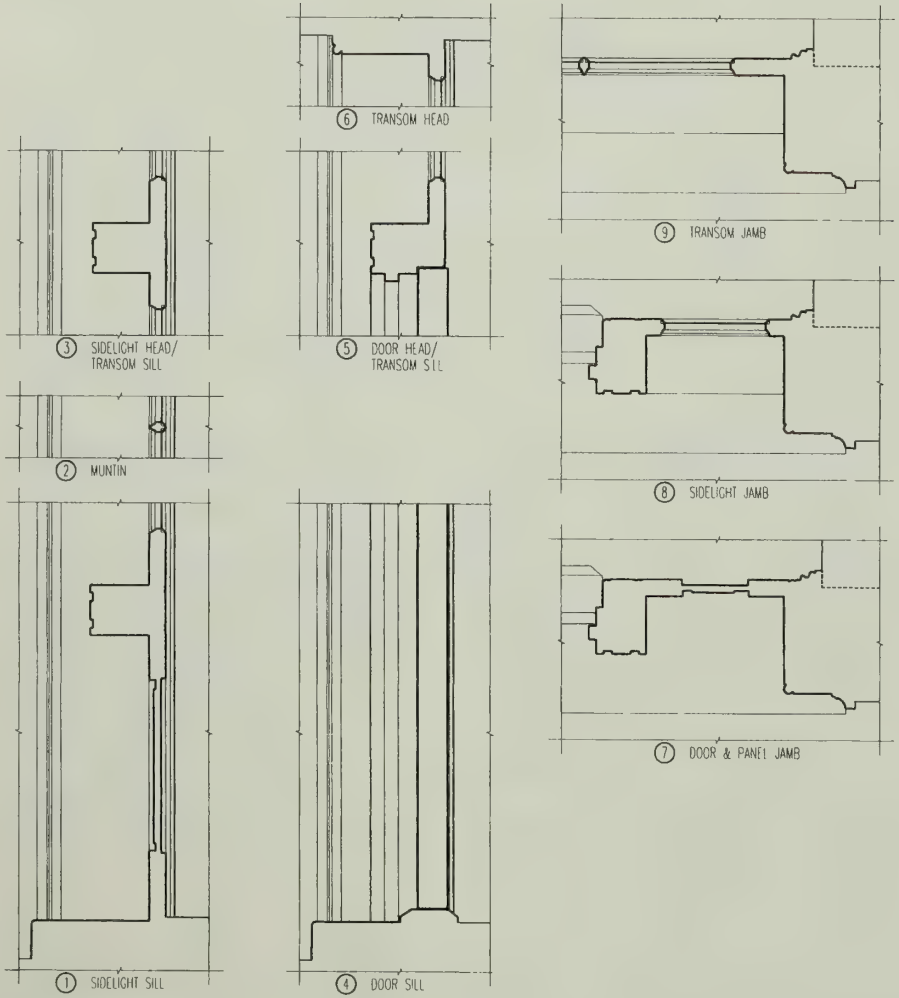

TYPE A
TYPE B
TYPE C
TYPE D
TYPE E
TYPE F
TYPE G
TYPE H
TYPE I
TYPE J
TYPE K
TYPE L
TYPE M
TYPE N
TYPE O
TYPE P

DOOR ELEVATIONS

SCALE 1/2" 1' 0"

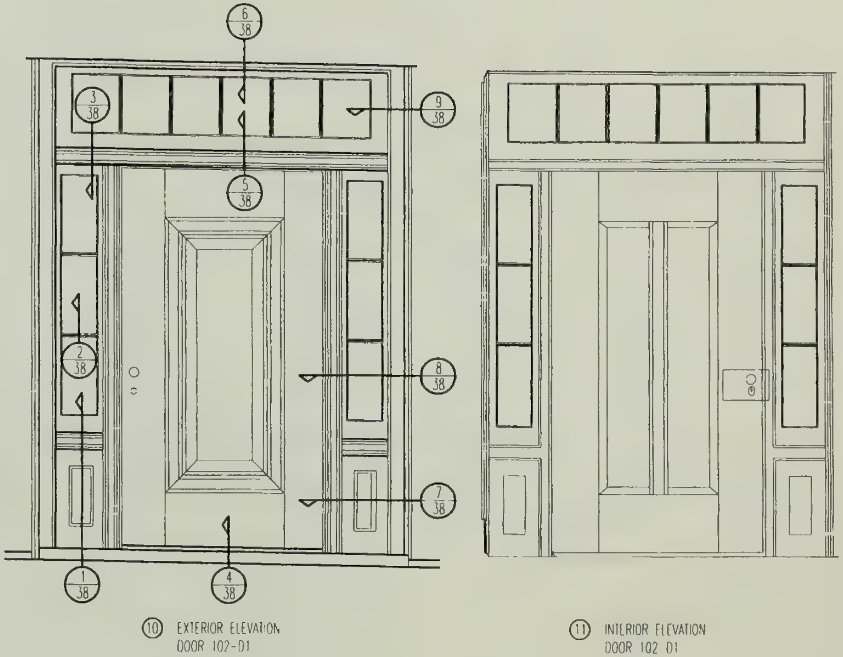
0 6" 30" 60"

DESIGNED	SHEET TITLE	AUTOCAD FILE MHEKSCDE	DRAWING NO 357/80002
DRAWN K R MAROLF TECH REV A W O'BRIGHT	EXISTING CONDITIONS\DOOR ELEVATIONS MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	SUB SHEET	SHEET 39
DATE JUNE 25, 1992			OF 43


⑥ TRANSOM HEAD
⑨ TRANSOM JAMB
③ SIDELIGHT HEAD/ TRANSOM SILL
⑤ DOOR HEAD/ TRANSOM SILL
② MUNTIN
⑧ SIDELIGHT JAMB
⑦ DOOR & PANEL JAMB
① SIDELIGHT SILL
④ DOOR SILL

FRONT DOOR DETAILS

SCALE 3" - 1'-0"
0 1" 5" 10"


6/38
3/38
9/38
5/38
2/38
8/38
7/38
1/38
4/38
⑩ EXTERIOR ELEVATION DOOR 102-D1
⑪ INTERIOR ELEVATION DOOR 102 D1

FRONT DOOR ELEVATIONS

SCALE 1" - 1'-0"
0 5" 10" 15" 30"

DESIGNED

DRAWN
L. M. JOHNSON

TECH REV
A. W. O'BRIGHT

DATE
JUNE 25, 1992

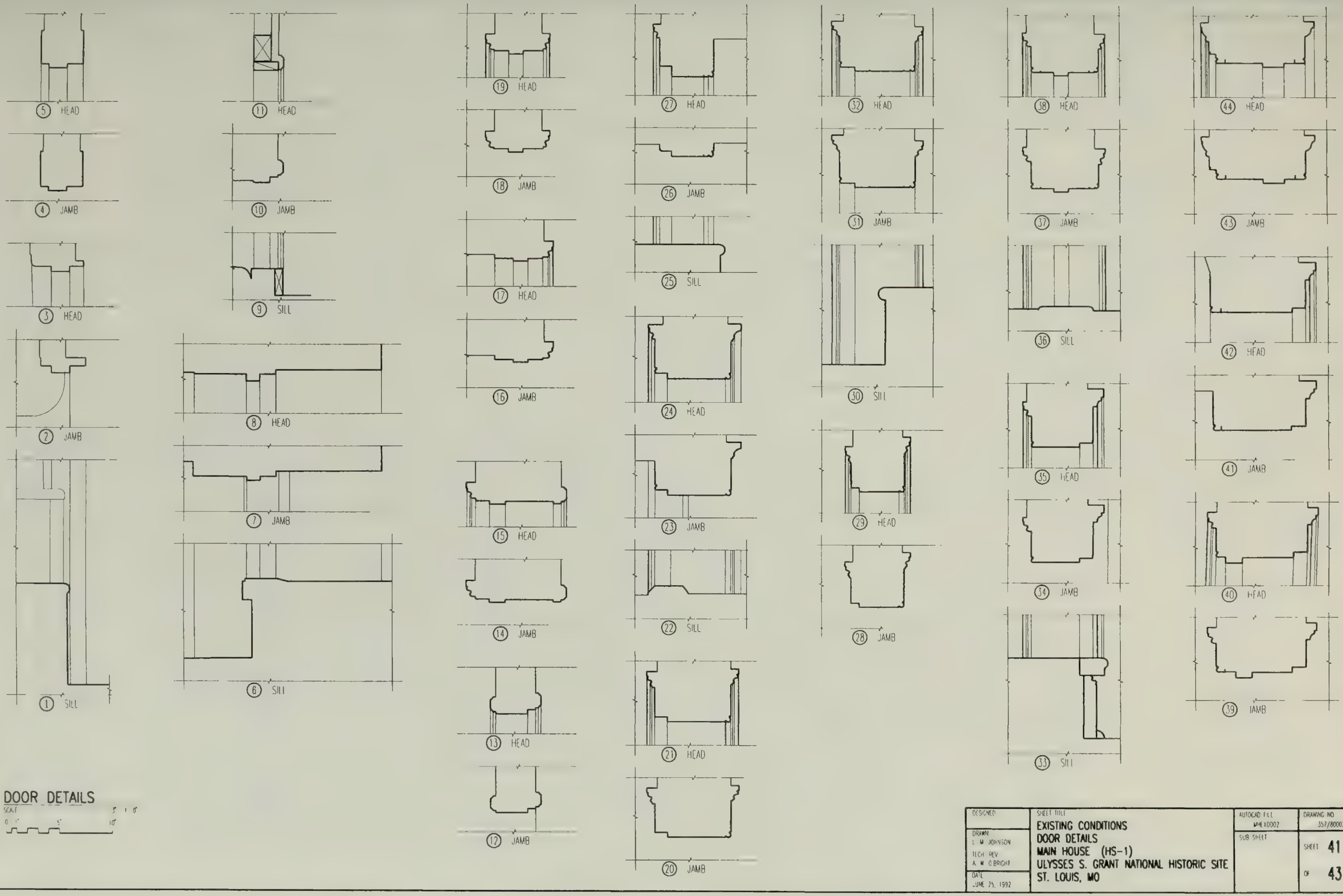
SHEET TITLE
EXISTING CONDITIONS
FRONT DOOR ELEVATIONS AND DETAILS
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEXD001

SUB SHEET

DRAWING NO
357/80002

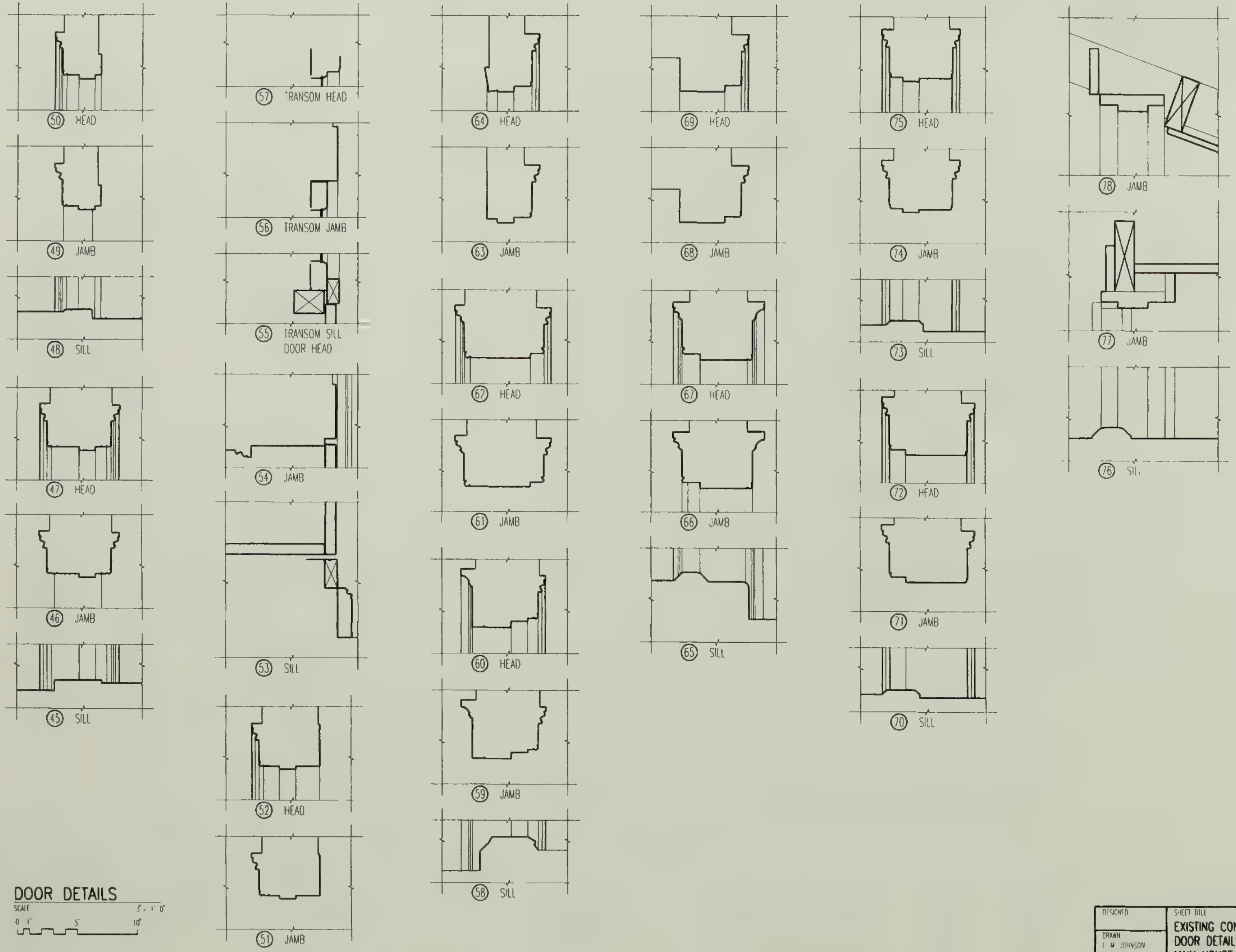
SHEET 40
OF 43



⑤ HEAD
④ JAMB
③ HEAD
② JAMB
① SILL
⑪ HEAD
⑩ JAMB
⑨ SILL
⑧ HEAD
⑦ JAMB
⑥ SILL
⑲ HEAD
⑱ JAMB
⑰ HEAD
⑯ JAMB
⑮ HEAD
⑭ JAMB
⑬ HEAD
⑫ JAMB
㉗ HEAD
㉖ JAMB
㉕ SILL
㉔ HEAD
㉓ JAMB
㉒ SILL
㉑ HEAD
⑳ JAMB
㉜ HEAD
㉛ JAMB
㉚ SILL
㉙ HEAD
㉘ JAMB
㊳ HEAD
㊲ JAMB
㊱ SILL
㉟ HEAD
㉞ JAMB
㉝ SILL
㊹ HEAD
㊸ JAMB
㊷ HEAD
㊶ JAMB
㊵ HEAD
㊴ JAMB
0 1" 5" 10"

DOOR DETAILS
SCALE 3" = 1'-0"

DESIGNED	SHEET TITLE EXISTING CONDITIONS DOOR DETAILS MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXD002	DRAWING NO 357/80002
DRAWN L. M. JOHNSON TECH REV A. W. O'BRIGHT DATE JUNE 25, 1992		SUB SHEET	SHEET 41 OF 43


50 HEAD
49 JAMB
48 SILL
47 HEAD
46 JAMB
45 SILL
57 TRANSOM HEAD
56 TRANSOM JAMB
55 TRANSOM SILL DOOR HEAD
54 JAMB
53 SILL
52 HEAD
51 JAMB
64 HEAD
63 JAMB
62 HEAD
61 JAMB
60 HEAD
59 JAMB
58 SILL
69 HEAD
68 JAMB
67 HEAD
66 JAMB
65 SILL
75 HEAD
74 JAMB
73 SILL
72 HEAD
71 JAMB
70 SILL
78 JAMB
77 JAMB
76 SILL
SCALE
0 1' 5' 10'
3' - 1' 0"

DOOR DETAILS

DESIGNED

DRAWN
L. M. JOHNSON

TECH. REV.
A. W. O'BRIGHT

DATE
JUNE 25, 1992

SHEET TITLE
EXISTING CONDITIONS
DOOR DETAILS
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS, MO

AUTOCAD FILE
MHEX0003

SUB SHEET

DRAWING NO
357/80002

SHEET 42
OF 43

EXISTING CONDITIONS ROOM FINISH SCHEDULE

ROOM MARK	ROOM DESCRIPTION	WALLS									CEILING			FLOOR			BASEBOARDS					CHAIR RAIL		NOTES
		SYSTEM				FINISH				TOTAL SF	SYSTEM	FINISH	TOTAL SF	SYSTEM	FINISH	TOTAL SF	TYPE				TOTAL LF	TYPE	TOTAL LF	
		N	E	S	W	N	E	S	W								N	E	S	W				
001	TRAIN ROOM	S4	S4	S4	S5	W2	W2	W2	W2	484	S5	W2	351	F3	W5	351								GYPBOARD AND FURRING REMOVED 1/92 @ WALLS & CEILING, CONC. BLOCK AND POURED-IN-PLACE CONC. NOW EXPOSED.
002	MECHANICAL	S2 S7	S5	S2 S15	S2	W2	W2	W4 W2	W4	420	S3	W1	216	F2	W1	216								
002-A	STAIRWELL	S7	S7 S5	NA	S8	W2	W2	W2	W2	115	U	W2	27	NA	W2									
002-B	TOILET	S7	S7	S7	S7	W2	W2	W2	W2	87	S7	W2	19	F2	W2	19								
002-C	HALL	S2	-	S2	-	W4	-	W4	-	35	S3	W1	-	F2	W1	-								
003	OFFICE	S2	S2	S2	S2	W5	W5	W5	W5	487	S3	W1	219	F3	W5	219								KNOTTY PINE T&G BOARDS OVER FRAMING REMOVED 7/91 FRAMING STILL REMAINS IN PLACE
003-A	EXTERIOR STAIR	S1	-	S1	-	W2	-	W2	-	-	NA	-	-	F2	W1	-								
003-B	CLOSET	S5	S5	S5	S5	W2	W2	W2	W2	93	S3	W2	15		W2	15								
004	PORCH CRAWL SPACE	S2	-	-	-	W1	W1	W1	W1	-	S3	W1	266	NA	W1	266								
005	BEDROOM	S7	S7	S7	S7	W3	W3	W3	W3	402	S7	W2	155	F3	W5	155	4	4	4	4	48'-8"			CEILING SUSPENDED BY WIRE
005-A	CLOSET	S7	S7	S7	-	W2	W2	W2	W2	58	S7	W2	4	F3	W2	4	5	5	5		5'-11"			
006	BATHROOM	S7	S7	S7	S7	W2 W6	W2 W6	W2 W6	W2 W6	163	S7	W2	32	F8	W6	32								
007	CRAWL SPACE	S1	S1	S1	S1	W1	W1	W1	W1	-	S3	W1	98	NA	W1	98								
008	CRAWL SPACE	S1	S1	S1	S1	W1	W1	W1	W1	-	S3	W1	32	NA	W1	32								
009	CRAWL SPACE	S1	S1	S1	S1	W1	W1	W1	W1	-	S3	W1	29	NA	W1	29								
010	CRAWL SPACE	S1	S1	S1	S1	W1	W1	W1	W1	-	S3	W1	151	NA	W1	151								
011	CRAWL SPACE	S1	S1	S1	S1	W1	W1	W1	W1	-	S3	W1	241	NA	W1	241								
101	LIVING ROOM	S7	S7	S7	S7	W2	W2	W2	W2	511	S7	W2	301	F6	W5	301	1	1	1	1	57'-1"	1	50'-11"	CEILING REMOVED 1997
102	ENTRY	S10	S10	U	S10	W2	W2	W2	W2	261	S7	W2	62	F6	W5	62	1	1	1	1	25'-4"			3/8" x 1 3/16" LATH @ EAST WALL
102-A	STAIRWELL	S10	-	-	S8	W2	W2	W2	W2	121	U	W2	-	F7	W2		1	-	1	-	11'-0"			WEST WALL LATH SLOPED TO FOLLOW STAIR
103	DINING ROOM	S8	S7 S8	S7	S8	W7	W7	W7	W7	516	S8	W2	245	F6	W5	245	1	1	1	1	44'-10"	1	44'-6"	
104	BEDROOM	S10	S10	S10	S10	W3 W2	W3 W2	W3 W2	W3 W2	567	S9 S10	W2	276	F6	W5	276	2	2	2	2	49'-7"	2	36' 4"	CHAIR RAIL ADDED 1310
104 A	HALL	U	U	S7	U	W2	W2	W2	W2	108	S7	W2	-	F6	W5	-	6	-	6	-	5'-8"			7/16" x 1 1/2" LATH @ NORTH & WEST WALLS
104-B	CLOSET	S7	S7	U	S7	W2	W2	W2	W2	147	S7	W2	16	F6	W5	16	7	7	7	7	12'-8"			
105	PORCH	S13	-	-	-	W2	-	-	-	-	S14	W2	266	F3	W2	266								3/4" x 5 1/4" T&C HORIZONTAL BOARDS BEHIND EAST WALL PLASTER, 7/8" x RANDOM T&G BOARDS ABOVE CEILING PLASTER
106	DRESSING ROOM	S7	S7	S10	S7	W3	W3	W3	W3	313	S9 S10	W2	112	F3	W5	112	3	3	3	3	35'-5"			
107	BATHROOM	S12	S12	S12	S12	W2 W6	W2 W6	W2 W6	W2 W6	217	S7	W2	55	F8	W6	55								3/8" x 1 3/8" LATH @ CEILING W/ WIRE & CUT NAILS
107-A	CLOSET	S7	S7	S10	S7	W2	W2	W2	W2	102	S7	W2	9	F3	W2	9	3	3	3	3	10'-5"			
108	BREAKFAST	S11	S5	S10	S7 S11	W2	W3	W2	W2	253	S11	W3	102	F9	W1	102	3	3	3	3	27'-4"	3	25'-9"	
108-A	PANTRY	S7	S7 S11	S7 S11	S7	W2	W2	W2	W2	164	S7	W2	16	F7 F9	W2 W1	16	3	3	3	3	15'-2"			EAST AND SOUTH WALLS REMOVED 1993
109	KITCHEN	S11	S11	S10	S11	W2	W2	W2	W2	242	S11	W3	106	F9	W1	106	4	3			14'-7"			
110	BREEZEWAY	-	S13	-	S13	W2	W2	W2	W2	-	S14	W2	392	F5	W2	392								
201	BEDROOM	S7	S7	S7	S7	W3	W3	W3	W3	403		W2	204	F6	W5	204	1	1	1	1	42'-2"			
201-A	CLOSET	S7	S7	S7	S7	W2	W2	W2	W2	67		W2	6	F6	W5	6	7	-	7	7	6'-8"			
202	HALL	S8	S8	U	S8	W2	W2	W2	W2	307		W2	110	F6	W5	110	1	1	1	1	31'-10"			
202 A	STAIRWELL	S5	S5	-	S5	W2	W2	W2	W2	192		W2	-	F6	W2		1	-	-	1	8'-11"			
203	BEDROOM	S7	S7	S7	S7	W2	W2	W2	W2	463		W2	242	F6	W5	242	1	1	1	1	50'-1"			
203-A	CLOSET	S7	S7	S7	S7	W2	W2	W2	W2	84		W2	8	F6	W5	8	7	7	7	-	8'-5"			
204	ATTIC-WEST					W1	W1	W1	W1	-		W1	-		W1	-								
205	PORCH	S13	-	-	-	W2	-	-	-	-	S14	W2	261	F7	W2	261								
206	BATHROOM	S12	S12	S12	S12	W2 W6	W2 W6	W2 W6	W2 W6	179		W2	40	F8	W6	40								
207	BATHROOM	S12	S12	S12	S12	W2 W6	W2 W6	W2 W6	W2 W6	178	S8	W2	38	F8	W6	38								
208	ATTIC-NORTH					W1	W1	W1	W1	-		W1	-		W1	-								
209	BREEZEWAY ATTIC	-	-	-	-	W1	W1	W1	W1	-	-	W1	-	-	W1	-								
301	MAIN ATTIC	S3	S3	S3	S3	W1	W1	W1	W1	1420	S3	W1	940	F7	W1	940								

WALL AND CEILING FINISH SYSTEMS

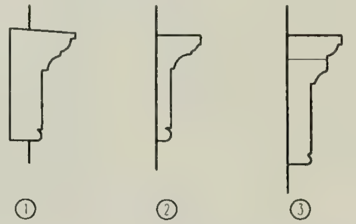
S1 -EXPOSED CONCRETE
S2 EXPOSED STONE
S3 EXPOSED WOOD FRAME
S4 -GYPSUM WALLBOARD OVER CONCRETE BLOCK/CONCRETE
S5 -GYPSUM WALLBOARD OVER FRAMING
S6 -VERTICAL T&G BOARDS OVER STONE
S7 -PLASTER OVER METAL LATH
S8 PLASTER OVER SPLIT LATH
S9 -PLASTER OVER VERTICAL SAWN LATH
S10 -PLASTER OVER CIRCULAR SAWN LATH
S11 PLASTER OVER GYPSUM LATH
S12 -CERAMIC TILE OVER PLASTER OVER METAL LATH
S13 SIDING
S14 -T&G BOARDS
S15 -MORTAR COAT OVER STONE

WALL FINISH

W1 UNFINISHED
W2 -PAINTED
W3 WALLPAPER
W4 -WHITEWASH
W5 -VARNISH
W6 CERAMIC TILE
W7 -PAINTED MURALS

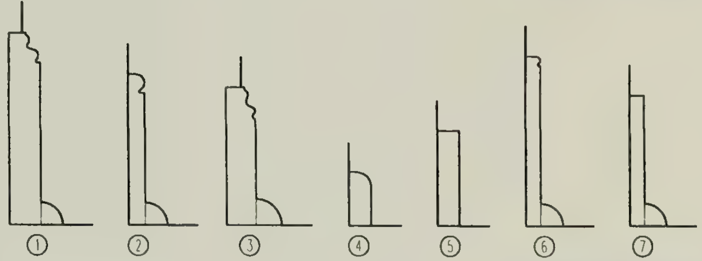
FLOOR FINISH SYSTEMS

F1 SOIL
F2 -CONCRETE SLAB
F3 WOOD STRIP
F4 -WOOD STRIP OVER CONCRETE SLAB
F5 -WOOD STRIP OVER WOOD SUBFLOOR
F6 T&G BOARDS (3/4 x 5 1/4) OVER ORIGINAL T&G BOARDS (1 1/8 1 1/4 x 4 1/2 5 1/2)
F7 T&G BOARDS
F8 CERAMIC TILE ON GROUT BED
F9 -ASBESTOS TILE



CHAIR RAIL TYPES

SCALE 6" = 1'-0"
0 1" 2" 5"



BASEBOARD TYPES

SCALE 6" = 1'-0"
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DESIGNED	SHEET TITLE EXISTING CONDITIONS ROOM FINISH SCHEDULE MAIN HOUSE (HS-1) ULYSSES S. GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHEXSCRF	DRAWING NO 357/80002
DRAWN K. R. MAROLF TECH REV A. W. O'BRIGHT		SUB SHEET	SHEET 43
DATE JUNE 25, 1992			OF 43

PART 2: TREATMENT AND USE

TREATMENT ALTERNATIVES

Several viable treatment alternative recommendations are discussed here that, in the least, develop a concept for project direction. Once a treatment alternative is proposed and accepted through the General Management Plan process, a more thorough effort will be made to fine tune treatments specific to materials and systems preservation. However, the alternative treatment information presented here will provide enough information to effect wise decisions with the goal of providing long-term preservation and accurate interpretation of the structure.

Because Grant was involved at White Haven during various periods between his first visit in 1843 until his financial forfeiture of the property in 1885, there are two or three phases in which the property could be interpreted. During the 1840s and 1850s Grant visited and lived in the house, but did not own it. From 1865 until 1885 Grant owned the place, but did not live in it. What extent Grant was responsible for decisions which resulted in physical alterations to the house is unknown. It is uncertain if Grant had any say or contributed labor toward modifications made to the house during Dent antebellum ownership, a period in which Grant was most involved with the house. And it is equally uncertain if he directed any of the minor changes made to the structure during the term he owned the property.

Legislation authorized the property as a national historic site:

> In order to preserve and interpret for the benefit and inspiration of all Americans a key property associated with the life of General and later President Ulysses S. Grant and the life of First Lady Julia Dent Grant, knowledge of which is essential to understanding, in the context of mid-nineteenth century American history, his rise to greatness, his heroic deeds and public service, and her partnership in them...[432]

This statement implies that the Grants' lives will be interpreted at the site, but is vague on treatment. It is believed that final treatment of the house is limited to the selection of three rational alternatives; preservation, or two periods of restoration. An alternative presented here to restore the exterior of the house but use the interior for contemporary uses such as park offices should be discouraged. Typically, when contemporary office requirement conflict with the preservation of historic fabric, the fabric looses. The interior would also be totally or partially closed to general public access. One other alternative, no action, addresses treatment to repair deteriorated elements and systems on an as-needed basis. The following alternatives will address the advantages and disadvantages of each treatment, a general description of treatment recommendations, cost estimates, and preliminary design drawings.

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432. Public Law 101-106. 2 October, 1989, act establishing Ulysses S. Grant National Historic Site.

Treatment Alternative 1 - Preservation

Legislation establishing Ulysses S. Grant National Historic Site directs that the site be "...preserve[d] and interpret[ed] for the benefit and inspiration of all Americans..."[433] This treatment alternative addresses preservation of the existing materials and spaces, and includes a minimum of restoration principals.

In this alternative, the structure would remain the same size and configuration as exists today. The only exceptions would be improvements and repairs to deficient building, mechanical, and electrical systems to promote long term preservation of the building. Generally, the Long House and West Wing are very much intact, but vast alterations have been to the structure through removal of several nineteenth century additions and porches, and modifications to internal room finishes. Some specific recommendations listed below lean more toward restoration rather than preservation. Sometimes it is more advantageous in terms of long-term preservation and maintenance to go back to some semblance of the original system, rather than replicate or repair a system that was under-designed or already deteriorated.

A disadvantage with selection of this alternative is that the building would be physically exhibited as it appeared in the late twentieth century when acquired by the NPS, and explanation of Grant's association with the house would rest upon the shoulders of park interpreters and exhibits. Much time may be wasted in explaining changes made to the structure, rather than the Grants' involvement with the place. The advantages over restoration treatments include that a minimum amount of historic fabric would be lost through construction activities over restoration treatments, and there would be no conjecture in the replacement or reconstruction of missing elements and additions.

The following addresses recommended treatments specific to building systems and elements to ensure long-term preservation of the house. Although the Stone Building and Workshop are joined to the Main House, the Main House in these proposals ends at the Stone Building and breezeway junction.

Interior Use

Because of the historic significance of the house, a philosophy of sensitive intervention would be used in determining function of specific spaces and the installation of supportive systems. Only those uses appropriate to the long-term preservation of historic fabric would be embraced. In general, the historic core area of the first floor would be devoted to interpretive tours, and 1940 additions be reserved for more intensive service uses. The second and attic floors not be included in general tours. The existing second floor structural system is very fragile and would require substantial intervention to withstand the pounding and loads delivered by groups of visitors on a daily basis. The second and attic floors would not be used at all, even for light storage, because of structural constraints. Also, accessibility and egress requirements for the second floor cannot be satisfied without substantial removal of historic fabric (see Accessibility Evaluation and Code Evaluation).

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[433] Public Law 101-106, October 2, 1989, act establishing Ulysses S. Grant National Historic Site. In November 1993, Senators John Danforth and Christopher Bond, and Congressman Richard Gephardt clarified in a letter to Superintendent Jill York O'Bright that the intent of Congress was that the structures be restored to their historic (i.e., Grant-associated) appearance.

Under this alternative, the interior of the house would be displayed to visitors, but other functions would need to be satisfied. A refuge would be provided for interpreters stationed daily in the house and for those visitors who may become ill during visitsThis refuge could be satisfied in Room 106, or Rooms 108 and 109 of the 1940 kitchen addition. Room 106 would provide an ideal office area for interpreters to monitor visitors approaching the house from the west.

Public restroom facilities would not be located in the building due to spacial constraints and accessibility requirements. An accessible unisex restroom would be installed in the existing first floor Restroom 107. The restroom would be available to park staff stationed at the house and to visitors with immediate needs.

Visitors cannot be allowed into the basement Room 003 due to life safety code egress requirements. The space cannot be made accessible without widening the stone foundation entrance, removing the cellar stair, and constructing an exterior ramp; work that would impact the historic appearance of the building. Therefore, the Room 003 entrance would remain in its existing configuration with repairs made to the bulkhead and doors. All other basement spaces would be reserved for utilities and light storage.

Accessibility

Few adjustments are required within the house to ensure accessibility of wheel chair assisted persons. Most of the required work is concentrated at the approach to the house. Assuming that the interpretive tour route is to lead visitors into the house through the front door, the existing flagstone walk leading to the front porch would have to be removed, graded to conform to slope standards, and repaved with flagstone expertly laid to ensure an acceptably even surface. A ramp constructed at the breezeway is an alternative route.

Since the front porch deck and the grade level at the east end of the porch are within 6 inches of one another, a grade ramp would be constructed to assist access to the porch. This would require the construction of a branch walk off the flagstone walk just in front of the porch. The walk would be constructed of a material to differentiate it from the flagstone walk. The walk could be constructed of concrete containing a buff color additive to reduce the brutal appearance of grey concrete. The grade ramp would not need handrails if the side-slope conforms to accessibility standards.

A small ramp is required at the front and back door thresholds. The ramp can be simply constructed and placed on top of the porch decks. No railings are required.

A ramp is required for access between Rooms 103 and 104. Since installation of a ramp at doorway 103-D3 would project considerably into Room 103 (approximately 8 feet), a portable ramp with handrails would be constructed. The ramp could be stored in an adjacent room not included in the tour route, and set into place when required.

If Bathroom 107 is to remain in active use, Door 107-D1 would have to be widened to conform to accessibility standards. There is plenty of floor area within Room 107 to install accessible fixtures, however.

The second floor would be closed to regular tours due in part to the challenge of achieving accessibility at that level without severely damaging or removing historic fabric. Because the second floor structural system is very weak, extensive work would be required to allow tours through the second floor. The two room and central hall configuration coupled with steep, narrow stairway does not provide enough area to sensitively place an elevator nor stair lift. The stair does not comply with standards for rise and run, width, and handrail placement. Loss of the historic stair to develop a new stair complying with current standards would greatly affect the appearance and character of the two central halls. Access to the attic would be limited for the purpose of maintenance and academic study.

If the basement winter Kitchen 003 is to be interpreted, the room can be made accessible to wheelchairs but at a cost to the landscape and a portion of the foundation. As with accessibility to the second floor, much historic fabric and character would be lost through the installation of an internal stair lift or elevator. An external ramp could be constructed leading to Door 003-D1, but between 25 feet and 30 feet of ramp would be required to achieve sufficient depth to access the basement floor. Construction of such a ramp would intrude on the landscape adjacent to the house. Since the doorway is not wide enough to satisfy accessibility standards, some of the historic foundation stone would be lost to attain even a minimum width.

Site

Branches and vegetation growing close to the roof and foundation would be removed. The front flagstone walk would be regraded and repaired (see Accessibility). The grade at the east elevation would be swaled to drain surface water around the structure.

Asbestos

Where accessible, all remaining materials identified in the 1991 *Asbestos Assessment Survey* by ATC Environmental Inc. as containing asbestos would be removed where the materials are exposed and accessible. Asbestos materials which are inaccessible to direct removal would be encapsulated.

Foundation

The concrete and concrete block eastern portion of the foundation is failing. This portion of the foundation would be replaced with an engineered concrete footing and walls. All other stone foundation walls would be underpinned to satisfy earthquake resistivity requirements. All existing stone walls and the chimney stacks would be deeply repointed. Installation of a perimeter drainage system is strongly recommended to reduce water pressure on existing historic walls. Bentonite waterproofing would be installed on those exterior foundation walls exposed during installation of the drainage system.

Structural Framing Systems

The walls are generally structurally sound, although stud bases and sills substituted with concrete at the eastern half of the foundation would be replaced with wooden sills and bases. This would prevent future termite infestation and water from wicking into framing. Deteriorated framing in the north wall of Room 206 would be repaired.

Poorly designed, insect damaged, and fraught with inappropriate alterations, the first and second floor structural systems will require substantial repair work. The first floor beams and joists can be reinforced with supplemental beams located in the basement. Several joists would be totally replaced, as powder post beetles have reduced the wood to frass packed tunnels beneath the Long portion of the house. The north end of the chimney girt in basement Room 001 would be scarfed with new material joined to a new foundation sill. The joint between that same beam and the summer beam would be reinforced. Although the West Wing first floor structural system appears to be in good condition, the remainder of the bark covering the joists would be fastened with adhesives to prevent further failure.

General tours would not be conducted in the second and attic floors due to the fragile condition of the floor structural systems. Bathrooms 206 and 207, including walls, ceramic floor systems, pipes, and ducts, would be removed to reduce dead loads. Removal of the 1940 furred finished floor at the second floor would assist in repair of the floor system and reduce dead loads to the structure.

Roof Systems

Some reinforcement of existing Long House rafters, particularly those adjacent to the dormers, is required. The roof structure and sheathing over Rooms 106 and 107 would be completely rebuilt.

Asbestos/cement shingles were replaced with temporary asphalt shingles as a temporary stabilization procedure in 1993. Ideally, replacement shingles would be of the same material and appearance as the removed shingles. However, asbestos bearing materials are banned from production. Cement based shingles are available but research would be required to find a style most accurately representing the asbestos/cement shingles removed from the house. Cement shingles would certainly afford more fire resistivity and are more durable than wood shingles.

Gutters and downspouts were replaced in 1993. All valley and chimney flashing, and gutters and downspouts would be replaced with copper metal. The profiles would match the removed gutters and downspouts. Runoff would be directed to a new underground drain system similar to the existing, or leaders could be added to the downspouts to at least direct water away from the foundation.

Exterior Cladding, Trim, and Finishes

Overall, the siding is sound but surface preparation is required especially at the ground floor north elevation and breezeway. The remainder of the cladding would be replaced where required, caulked, and painted. Fascia boards would be replaced particularly at the second floor eaves.

Since this treatment alternative is preservation oriented, the exterior finishes would remain in the same color scheme as exists today.

Lead Paint Removal

Occupational, Health and Safety regulations concerning removal of lead based paint have been recently strengthened. In this alternative lead based paint would be removed from all surfaces including exterior siding, windows, doors, and millwork. Total paint removal at this time would alleviate the need to take special precautions each time surface preparation work or repair work is performed on the house. If lead paint is not removed, the house may have to be closed to visitors anytime surface preparation work takes place. When the old paint is removed from exterior surfaces existing nail heads may have to be treated to prevent rust from diffusing through new paint coats.

Porches

The first floor porch deck and structural system is deteriorated and would be replaced. First floor posts would require repair and flashing work at the bases and capitols. The second floor deck and structural system is extremely deteriorated and would be replaced.

Chimneys and Fireplaces

All three chimneys are in a fragile state at present. The east chimney has an extremely poor foundation in association with a failing basement wall. The east chimney stack foundation cannot be replaced without an extraordinary, and dangerous, effort to support the upper section of the stack. Therefore, the east chimney would be completely dismantled and rebuilt. The shafts of the central and west chimney stacks would be carefully dismantled to below the roof line and rebuilt. The mortared-in-place chimney caps would be removed and replaced with removable caps. All stacks would be seismically strengthened with a reinforced grout flue liner. Exterior surfaces and interior surfaces where exposed, including fire boxes, would be repointed, although in-situ areas of original pointing work would remain undisturbed.

Doors

All doors are in sound condition except those on the breezeway and the cellar hatch. Generally, the existing hardware would be repaired, where required to be of serviceable use, and the remainder of the hardware would remain untouched. No doors need to be substantially modified to accommodate accessibility requirements. However, paint would be removed from all surfaces. If the second floor, top floor system is to be removed, all historic second floor doors and frames would be repaired to reflect the change in floor height. The following are treatment recommendations for specific doors:

Cellar Hatch

- Replace with securable board and batten doors.

102-D1

- Modify sill to accommodate accessibility requirements.
- Replace missing hinge screws.
- Repair dead bolt.

102-D2
- Repair door and frame to ensure smooth operation.
- Repair dead bolt.

102-D3
- Remove barrel bolt and repair surrounding damaged surfaces.

109-D1
- Repair and reset historic rim lock.

Breezeway Doors
- Fix sliding doors in place and flash bases.
- Repair and secure two swinging doors.

201-D1
- Repair bottom style and feet of casing and trim.

203-D1
- Repair bottom style and feet of casing and trim.

Windows

Since this alternative is preservation oriented, all existing windows shall remain in place. Paint would be removed from a window surfaces and sash repaired to operable condition. Sash locks would be added for security. Broken glass and deteriorated glazing would be replaced. Interior glazing in the kitchen windows would be removed or vented to prevent entrapment of condensation.

Shutters

Existing shutters shall remain in place and be repaired. Missing and broken hinges and latches would be replaced or repaired. The shutters need not be operable, as many of them do not fit the window opening.

Interior Finishes

Overall, plaster finishes are in good, serviceable condition and require only patching of cracks and investigation holes. Selected areas of wall and ceiling finishes would also be removed for installation of a fire sprinkler system and perhaps structural repairs. All plaster patches would be made with wire lath and gypsum plaster. For surfaces with papered finishes, and requiring plaster repair or replacement work, the existing paper would be carefully removed in the work area to avoid damaging surrounding papers. New paper be installed to replicate the texture of the existing finish.

Under this alternative the wood strip floor in Room 003 would be removed and the hole punched through the concrete slab infilled with fresh concrete. The hole was created for archeological excavations. Retaining the existing concrete slab would ensure that any archeological remains beneath it would remain entombed. A concrete floor would also withstand the erosive effects of foot traffic and occasional water seeping through the foundation walls more than a soil floor. A bond break would be placed between the new concrete and the fireplace hearth exposed during archeological work.

The first floor tongue and groove board surface installed in 1940 would remain in place as sacrificial material to protect the underlying historic floor. Retaining this surface would also alleviate the necessity of relocating baseboards, and repairing doors, door casings, and chimney pieces whose bases were removed to accommodate the raised floor level. The existing floor surfaces would be refinished by chemically stripping wax and varnish coatings and applying water based urethane finishes to maintain a durable finish.

The second floor tongue and groove board surface installed in 1940 would be removed to reduce dead loads imposed on that floor's structural system. Wide gaps and holes found in the historic finish floor would be covered with thin sheet metal fastened with brads. Removal of the top floor would necessitate the repair of historic door and door casing bases, relocation of raised baseboards, and infilling of voids in the plaster walls.

Paint would be removed from baseboards, chair rails, and chimney pieces and repainted. Voids in baseboard runs, created as a result of removing second floor walls, would be infilled with baseboards to match adjacent profiles. All replacement millwork would be date-stamped on concealed surfaces and recorded.

The stairs would be removed of paint repairs be made to deteriorated nosings.

Mechanical Systems

All existing plumbing fixtures and pipes would be removed from the house and a new domestic water service line would be installed from Grant Road. A new sewer line would essentially follow the route of the existing sewer line to the west property line. The Cottage and Barn can be connected to the same line. Sewer service cannot be directed to Whitehaven Drive, as topography and the north property line stream impede installation. The ground floor bathroom would remain in service for use by interpreters and occasional visitors. Hose bibs would be installed in selected areas also.

The existing gas line is sufficient to operate the furnace, but all other branch lines to fireplaces and the kitchen would be disconnected and removed.

The existing furnaces would be replaced with energy efficient units to eliminate the need to vent exhaust gases into the historic chimney. The new furnaces would remain in the same place as the existing unless substantial revisions are made to the duct system. Plastic vent pipe can be routed to the north elevation to avoid activation of a masonry flue. The duct system would remain active, but repairs are required to mend registers and seal holes in ducts. Since most of the ground floor windows are sealed, the central air conditioning system would be repaired to operable condition.

A fire suppression system would be installed to protect the historic structure and occupants from fire. Installation of the system would require selective removal of finishes to access wall and ceiling cavities. Ceiling sprinkler heads would be flush mounted. A new, large-diameter pipe would need to installed to the house from Grant Road to provide water to the sprinkler system. The control valve can be located in rebuilt basement Room 001.

Electrical System

The entire electrical system would be replaced. Power would be supplied to a minimum of outlets required to maintain the structure and assist with interior lighting or exhibits. The existing outlets and fixtures would remain in place, although repairs would be required to those devices removed during physical investigation work. The ceiling fixture in Room 103 would not be installed as that fixture presents a hazard to the heads and faces of visitors and park personnel over 5 feet 8 inches in height.

Hard-wired fire and intrusion detection and alarm systems would be installed throughout the structure. A combination infrared and motion intrusion detector would be used in lieu of door and window contacts. Panels for these systems would be placed in basement Room 001.

Installation of a certified lightning protection is strongly recommended for the house. The system would be installed concurrent with the new roofing system at the exterior roof surface on the north and east faces.

Cost Estimate

Main House (HS-1)
Treatment Alternative 1 - Preservation
Ulysses S. Grant NHS

The following table summarizes Class B cost estimates associated with preservation of the Main House. In this alternative, the structure would remain at the same size and configuration as exists today, except improvements and repairs would be made to deficient building, mechanical, and electrical systems to promote long-term preservation of the building. All work is assumed to be accomplished by contract labor. These estimates reflect 1995 costs for completion of the proposed alternative. If implementation of a proposed treatment is delayed, the following figures must be reviewed and revised on an annual basis to include cost adjustments for material and services inflation.

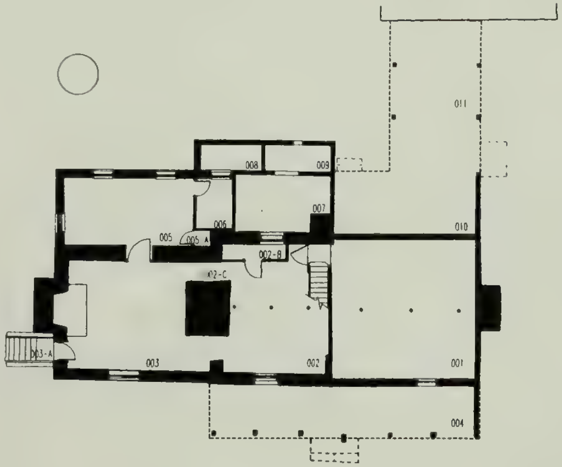
Category	**Description**	**Cost**
Site	Grading, walks, seeding	$21,200.00
Foundation	Foundation removal, shoring, excavation, new foundation walls, pointing existing stone, waterproofing, perimeter drainage, chimney repair and seismic stabilization	$147,200.00
Exterior	Roofing, gutters and downspouts, siding and porch repair, painting	$63,000.00
Structure	Framing repair and replacement, seismic reinforcement	$79,500.00
Doors	Repair existing doors, hardware repair	$17,800.00
Windows	Repair existing windows and shutters	$74,000.00
Interior Finishes	Floor and finish demolition, plastering, millwork, painting, finish conservation	$57,000.00
Mechanical	Water supply, waster lines, furnace, duct repairs, fire suppression system, water pump	$190,700.00
Electrical	Electrical and lighting systems, lightning protection	$92,600.00
Security	Intrusion detection and alarm, fire detection and alarm	$10,300.00
	Subtotal	$753,300.00
General Conditions	Insurance, temporary utilities, mobilization, equipment (10%)	$75,330.00
	Subtotal	$828,630.00
	Profit and Overhead (15%)	$124,294.50
	Subtotal	$952,924.50
	Contingency (15%)	$142,938.68
	Total (Construction)	$1,095,863.18
A/E Title II	Structural, mechanical, and electrical construction documents	$45,198.00
WASO Contingency	(31%)	$339,717.58
Archeology	Archeological mitigation	$50,000.00
	Total (Construction, Design, Inspection, Archeology)	$1,530,778.76

MAIN HOUSE (HS-1)
TREATMENT ALTERNATIVE DRAWINGS
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS COUNTY, MISSOURI

LIST OF DRAWINGS

1.	TITLE SHEET	
2.	ALTERNATIVE 1:	FLOOR PLANS
3.	ALTERNATIVE 1:	EXTERIOR ELEVATIONS
4.	ALTERNATIVE 1:	EXTERIOR ELEVATIONS
5.	ALTERNATIVE 2:	FLOOR PLANS
6.	ALTERNATIVE 2:	EXTERIOR ELEVATIONS
7.	ALTERNATIVE 3:	FLOOR PLANS
8.	ALTERNATIVE 3:	EXTERIOR ELEVATIONS
9.	ALTERNATIVE 4:	FLOOR PLANS
10.	ALTERNATIVE 4:	EXTERIOR ELEVATIONS

CONCURRED ASSOCIATE REGIONAL DIRECTOR DATE APPROVED: REGIONAL DIRECTOR DATE	RECOMMENDED SUPERINTENDENT DATE CHIEF CULTURAL RESOURCES MANAGEMENT DATE	DESIGNED DRAWN K R MAROLF L M JOHNSON TECH REV A W O'BRIGHT DATE JUNE 25 1992	SHEET TITLE TREATMENT ALTERNATIVES TITLE SHEET MAIN HOUSE (HS-1) ULYSSES S GRANT NATIONAL HISTORIC SITE ST. LOUIS, MO	AUTOCAD FILE MHTATITL SUB SHEET	DRAWING NO 357/80006 SHEET 1 OF 10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008
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007
010
006
005
005-A
002-B
002-C
003-A
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002
001
004

BASEMENT FLOOR PLAN
SCALE 1/8" = 1'-0"
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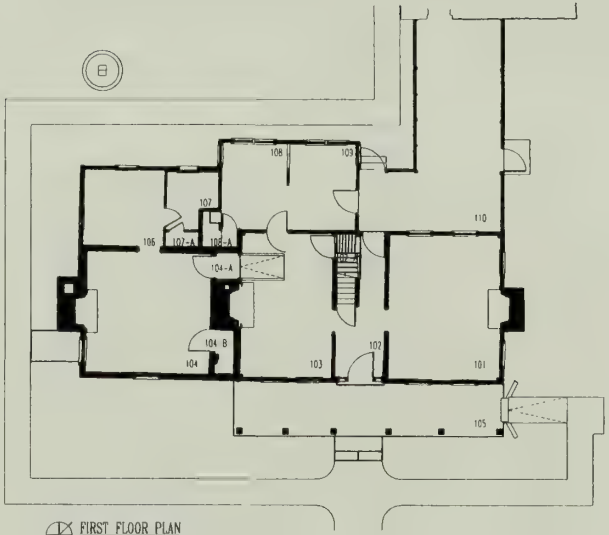
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107-A
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104 B
102
104
103
101
105

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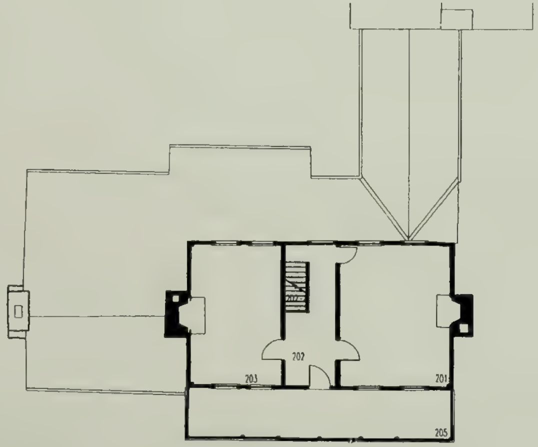
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203
201
205

SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"
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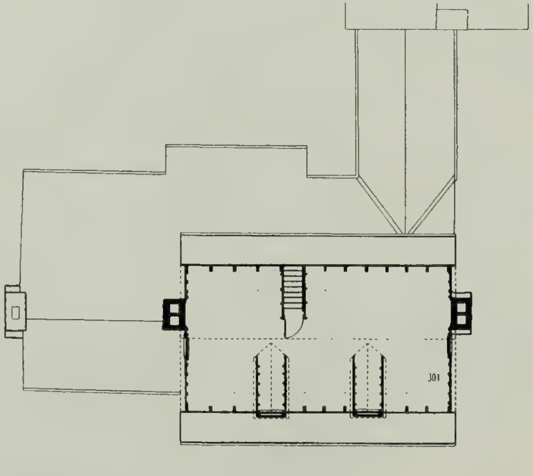

ATTIC FLOOR PLAN
SCALE 1/8" = 1'-0"
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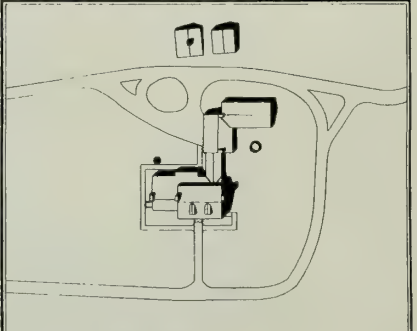
NOTES



SITE PLAN
SCALE 1/50" = 1'-0"

SHEET TITLE
DESIGN DEVELOPMENT
ALTERNATIVE 1 PRESERVATION
WHITE HAVEN
ULYSSES S GRANT NHS
ST LOUIS, MO

DESIGNED

DRAWN
K R MAROLF

TECH REV
A W O'BRIGHT

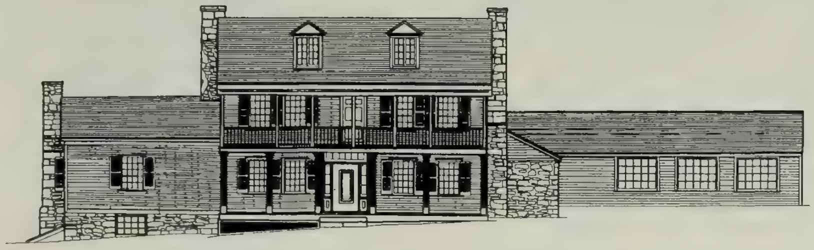
DATE
1/6/93

DRAWING NO
357/80006

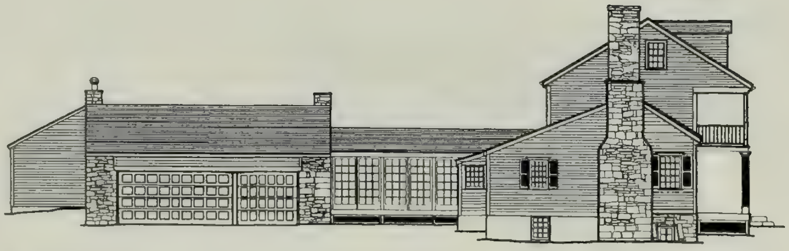
AUTOCAD FILE
WHTAFP01

SHEET 2
OF 10

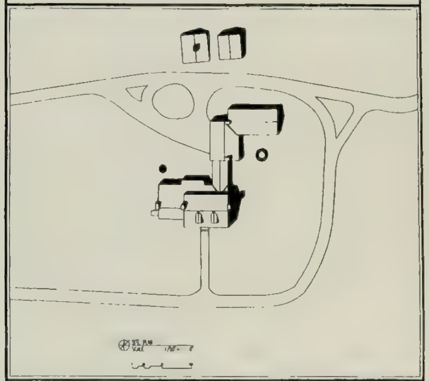
NOTES:



SOUTH ELEVATION
SCALE 1/8" = 1'-0"



WEST ELEVATION
SCALE 1/8" = 1'-0"



SHEET TITLE
DESIGN DEVELOPMENT
ALTERNATIVE 1 PRESERVATION
WHITE HAVEN
ULYSSES S GRANT NHS
ST LOUIS, MO

DESIGNED

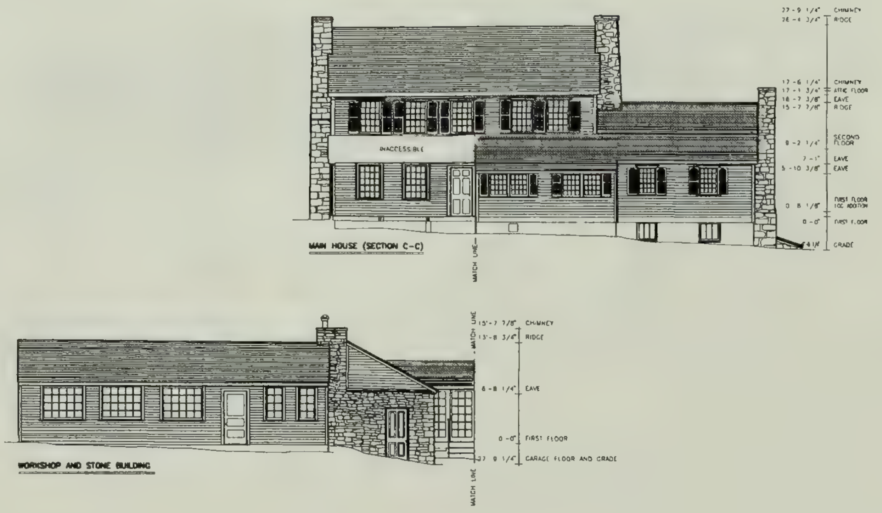
DRAWN
K R MAROLT
TECH REV
A W OBRIGHT

DATE
1/6/91

DRAWING NO
357/80006

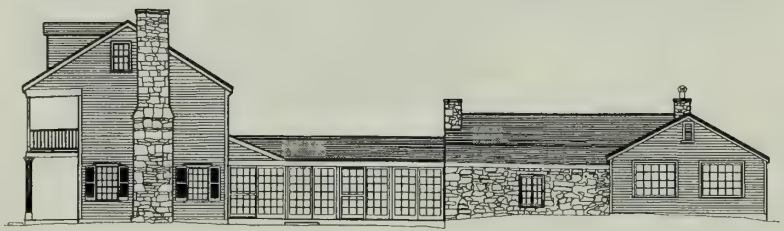
AUTOCAD FILE
WHTAEE3A

SHEET 3
OF 10



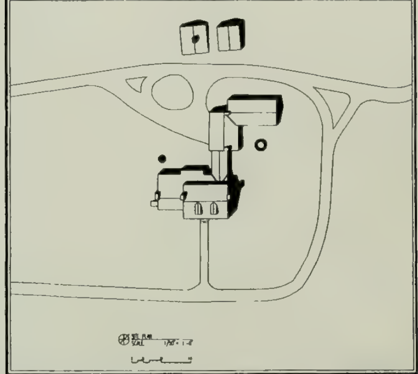
INACCESSIBLE
MAIN HOUSE (SECTION C-C)
MATCH LINE
27 - 9 1/4" CHIMNEY
26 - 4 3/4" RIDGE
17 - 6 1/4" CHIMNEY
17 - 1 3/4" ATTIC FLOOR
16 - 7 3/8" EAVE
15 - 7 7/8" RIDGE
8 - 2 1/4" SECOND FLOOR
7 - 1" EAVE
5 - 10 3/8" EAVE
0 8 1/8" FIRST FLOOR LOG ADDITION
0 - 0" FIRST FLOOR
-4 1/4" GRADE
WORKSHOP AND STONE BUILDING
MATCH LINE
15'-7 7/8" CHIMNEY
13'-8 3/4" RIDGE
8 - 8 1/4" EAVE
0 -0" FIRST FLOOR
-27 8 1/4" GARAGE FLOOR AND GRADE
MATCH LINE

NORTH ELEVATION
SCALE 1/8" = 1'-0"



EAST ELEVATION
SCALE 1/8" = 1'-0"

NOTES.



SITE PLAN
SCALE 1/32" = 1'-0"

SHEET TITLE
DESIGN DEVELOPMENT
ALTERNATIVE 1 PRESERVATION
WHITE HAVEN
ULYSSES S GRANT NHS
ST. LOUIS, MO

DESIGNED

DRAWN
K R MAROLF

TECH REV
A W O'BRIGHT

DATE
1/6/93

DRAWING NO
357/80006

AUTOCAD FILE
WHTAEE1B

SHEET 4
OF 10

Treatment Alternative 2 - 1860 Restoration

This treatment alternative addresses the period Grant was living and working on Dent-owned property. The period begins at 1854, when he was reunited with his small family upon return from army service in California, until 1859, when family left White Haven for Galena, Illinois. The alternative would restore the house to the appearance seen in Figure 2.3. Restoration to this period is possible through the interpretation of the photographic and lithographic collection currently at hand, and physical evidence remaining within the historic core of the present house. However, there are some features, particularly at the rear of the house, for which there is little or no physical evidence remaining or historical documentation.

The title of this treatment alternative, restoration, does not imply restoration in an absolute sense. The recommended treatment would include an amalgam of partial reconstruction, preservation, and repair techniques to achieve the goal of presenting the house at the stated time period while allowing for compromises which would assist in the perpetuation of historic fabric. But, however great a quantity of evidence is available, an exact copy of the structure at any one point in time is not possible. There are always details which cannot be mastered as the information is not always present.

Some of the recommended treatments presented in Alternative 2 parallel those found in Alternative 1, particularly with respect to the historic core of the building. To that end, a philosophy of preservation would be enforced in treating the remaining historic fabric of the structure. Unfortunately, some historic fabric would inevitably be lost in this alternative during the course of construction. Only through strong control of the design and construction processes would a minimum of historic material be lost.

Interior Use

A concept of sensitive intervention would be used in determining the function of specific spaces and the installation of supporting systems. Only those uses appropriate to the long term preservation of historic fabric would be embraced. In general, the historic core area of the first floor can be devoted to interpretive tours, and reconstructed additions reserved for more intensive service uses as there is more flexibility in intervention. The second and attic floors would not be included in general tours because the existing second floor structural system is very fragile and would require substantial intervention to withstand the pounding and loads delivered by groups of visitors on a daily basis. The second and attic floors would not be used at all, even for light storage. Also, accessibility and egress requirements for the second floor cannot be satisfied without substantial removal and alteration of historic fabric (see Accessibility and Code Evaluations).

Although the interior of the house is anticipated to be principally displayed to visitors, other functions would need to be satisfied. A climate controlled refuge would be provided for interpreters stationed daily in the house and for those visitors who may become ill during visits. This refuge could be satisfied in either the reconstructed Hunt Addition or East Wing.

Large public restroom facilities would not be located in the building due to spacial constraints and accessibility requirements. If restroom facilities are required, an accessible unisex restroom would be installed in Room 112, the small restored Hunt Addition Room 112. The restroom would be available to park staff stationed at the house and to visitors with immediate needs.

Room 111 in the restored Hunt Addition would be adapted for exhibits. The isolation of the East Wing Room 115 would provide an ideal location for an interpretation division office.

Visitors cannot be allowed into the basement Room 003 due to life safety code egress requirements. The space cannot be made accessible without widening the stone foundation entrance, removing the cellar stair, and constructing an exterior ramp; work that would impact the historic appearance of the building. Therefore, the Room 003 entrance would remain in its existing configuration with repairs made to the bulkhead and doors. All other basement spaces would be reserved for utilities and light storage.

Accessibility

Few adjustments are required within the house to ensure accessibility. Most of required work is concentrated at the approach to the house. Assuming that the interpretive tour route leads visitors into the house through the front door, the existing flagstone walk leading to the front porch would have to be removed, graded to conform to slope standards, and repaved with flagstone expertly laid to ensure an acceptably even surface. The least slope attainable for the walk is 1:12. According to existing accessibility standards, slopes of greater than 1:20 are considered ramps, and therefore are required to have handrails on both sides.[434] While modification of topography to the 1:12 slope is attainable without significant change to the historic scene, the addition of railings would be extremely obtrusive to the historic scene and inconsistent with the restoration philosophy of this alternative.[435] To achieve a 1:20 walkway slope, substantial recontouring would be required, and the walk would have to switchback rather than lead straight to the porch. This, too, would mare the historic character of the site. The flagstone walk would be modified to achieve a 1:12 slope, and no handrails be installed. An alternative route can be established to bring visitors to a rear porch ramp over accessible paths. That permanent ramp can be constructed just off the end of the Hunt Addition porch, and extended east between the Main House and the Stone Building.

Since the front porch deck and the grade level at the east end of the porch are within 6 inches of one another, a grade ramp would be constructed to assist access to the porch. This would require the construction of a branch walk off the flagstone walk just in front of the porch. The walk would be constructed of a material to differentiate it from the flagstone walk. The walk could be constructed of concrete containing a buff color additive to reduce the brutal appearance of grey concrete. The grade ramp would not need handrails if the side-slope conforms to accessibility standards.

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[434] *Uniform Federal Accessibility Standards* (UFAS) (Washington D.C.: Architectural and Transportation Barriers Compliance Board, 1985), 18 (4.3.7) and 25 (4.8.5), (hereafter cited as UFAS).

[435] UFAS, 13 (4.1.7). According to UFAS the Advisory Council on Historic Preservation shall determine on a case-by-case basis whether requirements for ramps would destroy the significance of the building or scene.

A small ramp is required at doors accessible from porches to cross sills, including Doors 102-D1, 102-D2, 106-D1, and 111-D1. The new unisex bathroom (addressed in Mechanical Systems) may require a small ramp, as the porch deck would rise to the level of the floor. These ramps can be simply constructed and placed on top of the porch deck. No railings are required.

A ramp is required for access between Rooms 103 and 104. Since installation of a ramp at the Doorway 103-D3 would project considerably into Room 103 (approximately 6 feet if the over-floor is removed from 104), a portable ramp with handrails would be constructed. The ramp could set into place when required by visitors but there are few places where such a ramp could be stored when not in use.

NPS employees and the public must have access to the East Wing First Aid/Office 115. A ramp would be constructed at the north side of the wing so as not to detract from the historic appearance at the front of the Main House. Hall 116 accessing the door to the East Wing room would have to be wider than historic conditions to accommodate wheelchairs, however. This can be accomplished without substantially changing the historic appearance by constructing a short section of curtain wall at the south elevation to conceal the widened hall.

The second floor would be closed to regular tours due in part to the challenge of achieving accessibility at that level without severely damaging or removing historic fabric (see Floor Structural Systems for closing the second floor from a structural standpoint). The central hall flanked by two rooms configuration coupled with steep, narrow stairway does not provide enough area to sensitively place an elevator or stair lift. The stair does not comply with standards for rise and run, width, and handrail placement. Loss of the historic stair to develop a new stair complying with current standards would greatly affect the appearance and character of the two central halls. Access to the attic would be limited for the purpose of maintenance and academic study.

Site

Branches and vegetation growing close to the roof and foundation would be removed. The front flagstone walk would be regraded and repaired (see Accessibility). The grade at the east elevation would be swaled to drain surface water around the structure. An approved cultural landscape report should be completed prior to the planting of new trees.

Asbestos

All remaining materials identified in the 1991 report, *Asbestos Assessment Survey* by ATC Environmental Inc., as containing asbestos would be removed prior to initiation of general construction work. Ducts concealed in walls slated to be removed during restoration would be exposed through removal of finishes, and asbestos bearing duct tape removed by a licensed contractor.

Foundation

The concrete and concrete block eastern portion of the foundation is slowly failing. This portion of the foundation would be replaced with an engineered concrete footing and walls topped by limestone rubble above grade. All other stone foundation walls would be underpinned to satisfy earthquake resistance requirements. All existing stone walls would be deeply repointed.

A perimeter drainage system would be installed to reduce water pressure on existing historic walls. Bentonite waterproofing would be installed on those exterior foundation walls exposed during installation of the drainage system.

New reinforced concrete foundations topped with limestone are recommended for the reconstructed Hunt Addition and East Wing. These basement rooms would be ideal for placement of new electrical and security panels and the sprinkler valve. New cast concrete piers to grade are recommended for porch supports.

Wall Structural Systems

The walls are generally structurally sound, although stud bases and sills substituted with concrete at the eastern half of the house and around the Room 106 foundation would be replaced with wooden sills and bases. The area of deteriorated wall framing at the second floor level at the north wall of Room 206 would be repaired.

Floor Structural Systems

Poorly designed, insect damaged, and fraught with unwise alterations, the first floor would require substantial work to withstand the rigors of tours. Deficient second floor framing, especially in Room 201, would be reinforced to prevent future deflection of the floor system. Second floor framing, and thus the first floor ceilings, would remain in the current deflected state. The first floor beams and joists can be reinforced with supplemental beams located in the basement. Several joists would be totally replaced as powder post beadles have reduced the wood to frass-packed tunnels beneath the Long portion of the house. The north end of chimney girt in basement Room 001 would be repaired with new material joined to a new foundation sill. The joint between that same beam and the summer beam would need to be reinforced.

Although the West Wing first floor structural system appears to be in good condition, the remainder of the bark covering the joists would be fastened with adhesives to prevent further failure.

A full-span joist adjacent to the stairwell at the attic floor, severed upon installation of the duct system in 1940, would be repaired to return continuity to the member.

Roof Systems

The two existing dormers would be removed and new rafters installed to replace those that were severed to install the dormers. The roof structural system over Rooms 106 and 107 would be completely replaced. All roof sheathing would be replaced with spaced board sheathing to promote drying of wood shingles. New wood shingles would be installed directly over the board sheathing. The shingles would be pressure treated with at least a Class C fire retardant.

Although the house had no flashing nor gutters in 1860, these systems would be installed to direct water away from the structure. All valley and chimney flashing, and gutters and downspouts would be replaced with lead coated copper. The gutters would be half-round and the downspouts smooth round profiles. Runoff would be directed to a new underground drain system similar to the existing, or leaders could be added to the downspouts to at least direct water away from the foundation.

Exterior Cladding, Trim, and Finishes

Any replacement or infill cladding shall match adjacent cladding as close as possible. The remainder of the cladding would be caulked and painted. Fascia boards would be replaced particularly at the second floor eaves. The exterior would be painted beige with terra cotta trim as identified in the paint analysis.

Lead Paint Removal

Occupational, Health and Safety regulations concerning removal of lead based paint have been recently strengthened. In this alternative lead based paint would be removed from all surfaces including exterior siding, windows, doors, and millwork. Total paint removal at this time would alleviate the need to take special precautions each time surface preparation work or repair work is performed on the house. If lead paint is not removed, the house may have to be closed to visitors anytime surface preparation work takes place. When the old paint is removed from exterior surfaces, existing nail heads may have to be treated to prevent rust from diffusing through new paint coats.

Porches

The existing first floor porch deck and structural system is deteriorated and would be replaced. First floor posts would require repair and flashing work at the bases and capitols. The second floor deck and structural system is extremely deteriorated and would be replaced. All deteriorated beams and joists would be replaced in kind. All fascia at this deck would be replaced in kind.

The rear porch would be reconstructed as indicated in the alternative treatment drawings. The porch deck and rear porch canopy at the West Wing would reflect conditions seen in the 1860 photograph of the house. However, there are numerous details concerning the appearance of the rear porch that are unknown at this time. Most details would be conjectural.

Chimneys and Fireplaces

All three chimneys are in a fragile state at present. The east chimney has an extremely poor foundation in association with a failing basement wall. The chimney foundation cannot be replaced without an extraordinary, and dangerous, effort to support the upper section of the stack. Therefore, the east chimney would be completely dismantled and rebuilt. The shafts of the central and west chimney stacks would be carefully dismantled to below the roof line and rebuilt. The mortared-in-place chimney caps would be removed and replaced with removable caps. All stacks would be seismically strengthened with a reinforced grout flue liner. Exterior surfaces and interior surfaces where exposed, including fire boxes, would be repointed although in-situ areas of original pointing work would remain undisturbed.

Brick hearths at FP2, FP5, and FP6 would be taken up and lowered to their original position. The fireboxes would remain undisturbed to prevent the possibility of unintended damage.

Doors

Existing historic doors are, overall, in sound condition. Where doors are required for new construction, new panel doors of construction similar to the historic doors would be installed. Existing nineteenth century hardware would be repaired where required to be of serviceable use, and the remainder of the hardware would remain untouched. No existing doorways need to be substantially modified to accommodate accessibility requirements. The following are treatment recommendations for specific doors:

Cellar Entry
- Replace with board and batten door sized to historic proportions.

101-D1
- Reconstruct door to match other early doors in the Long House.

102-D1
- Modify sill to accommodate accessibility requirements.
- Replace missing hinge screws.
- Repair dead bolt.
- Remove knocker.

102-D2
- Repair door and frame to ensure smooth operation.
- Replace glass with wooden panels.

102-D3
- Remove barrel bolt and repair surrounding damaged surfaces.

103-D1
- Return door leaf from 103-D4 and repair.

103-D4
- Remove door and infill with window.
- Salvage south casing.
- Move door leaf to 103-D1.

104-D1
- Restore leaf to original position and repair.

104-D3
- Reconstruct new door leaf to match Stone Building Door D-2.

- Remove second casing at north face.

201-D1
- Repair bottom style and feet of casing and trim.

203-D1
- Repair bottom style and feet of casing and trim.

Windows
All historic, serviceable windows shall be repaired to operable condition to ensure smooth operation, and hardware added for security. All nonhistoric windows, including 101-W4, 101-W5, 201-W2, 203-W2, 203-W4, and 206-W1, would be removed and the resultant voids infilled. Broken glass and deteriorated glazing would be replaced. Window 101-W6 would be removed and returned to its previous position at present Door 103-D4.

Shutters
Existing shutters would be salvaged and stored. New operable shutters would be fabricated for windows requiring them. New hand wrought hinges and catches would be installed. Although the color of the historic shutters is unknown, dark brown would be considered to complement the beige siding and terra cotta trim.

Interior Finishes
Overall, existing plaster finishes are in good serviceable condition and require only patching of cracks and investigation holes, and infilling voids created through removal of windows, mechanical systems, and walls. Selected areas of wall and ceiling finishes would also be removed for installation of a fire suppression system, asbestos removal, and structural repairs. All plaster patches would be made with wire lath and gypsum plaster. All papered wall finishes would be removed to the plaster surface.

The first floor tongue and groove board surface installed in 1940 would remain in place in Rooms 101, 102, and 103 as sacrificial material to protect the underlying historic floor. Retaining this surface would also alleviate the necessity of relocating baseboards, and repairing doors, door casings, and chimney pieces whose bases were removed to accommodate the raised floor level. The existing floor surfaces would be refinished by chemically stripping wax and varnish coatings and applying water-based urethane finishes to maintain a durable finish.

The over-floor in Room 104 can be removed to the nineteenth century, painted strip floors provided that carpets are laid to protect the surface. Removal of this flooring would lower the floor level at least 2 inches closer to the Room 103 floor level, allowing for a shorter wheelchair ramp between the spaces. Areas of the historic floor would be repaired.

The second floor tongue and groove board surface installed in 1940 can be removed to reduce dead loads imposed on the floor's structural system, or left in place to serve as sacrificial surface much like at the first floor. If the contemporary floor is removed, wide gaps and holes found in the historic finish floor would be covered with thin sheet metal fastened with brads. Removal of the top floor would necessitate the repair of historic door and door casing bases, relocation of raised baseboards, and infilling of voids in the plaster walls. An alternative is to leave the second floor to provide a cavity to place conduit and fire suppression pipes.

Paint would be removed from baseboards, chair rails, and chimney pieces. Voids in baseboard and chair rail runs, created as a result of removing walls and cabinets, would be infilled with baseboards to match adjacent profiles. All replacement millwork would be date-stamped on concealed surfaces and recorded.

The stairs would remain untouched except for repairs which would be made to deteriorated nosings. The basement stairs may have to be rebuilt.

The following specific work would be initiated for individual rooms:

Basement 002
- Remove Restroom 002-A and restore stone and joist surfaces.
- Remove all ducts, furnaces, and other utility devices.

Winter Kitchen 003
- The wood strip and concrete slab floors in Room 003 would be completely removed and the dirt floor left exposed.
- Portland cement based mortar would be removed from interior walls as much as possible in preparation for general repointing.
- Since some of the ceiling joist bark is loose, methods would be explored to stabilize the bark in place.
- Areas of the stone foundation removed during 1940 renovation work would be filled. Specifically, the Door 005-D1 opening, the wall at the northeast corner of the room, and the knee wall at the southeast corner of the room between the chimney stack foundation and south wall.

Parlor 101
- Reconstruct the fireplace chimney piece based upon measured drawing prepared prior to its loss.
- Remove the furred west and north walls and return them to original location.

Dining Room 103
- Reset the original fireplace chimney piece.
- Remove furred portion of east wall and return it to original location.
- Remove cabinet.

Dining Room 104
- Remove chair rail installed in 1940.
- Remove cabinet and shelves.

Hall 104-A
- Remove ceiling and return to original height.
- Remove north wall to restore Door 108A-D1 to operable condition.

Closet 104-B
- Remove plaster wall and ceiling finishes to expose underlying horizontal tongue and groove board finishes.

Hunt Addition
East Wing
- All wall and ceiling finishes are to be plaster over metal lath.
- Floor finishes are to be wood tongue and groove similar to the original floor finishes in the main house.
- Baseboards shall match the profile of baseboards found in the main house.
- Hunt Addition chair rails shall match historic sample found on site.
- Hunt Addition fireplace mantle shall be designed similarly to that found in the Main House.
- Replacement doors are to match those found in the Main House.

Bedroom 201
- Remove Bathrooms 206 and 207 and Closet 201-A.
- Remove furred east wall and return to original location.

Hall 202
- Remove Closet 203-A and Door 206-D1 and infill resultant voids.
- Return Stair S-1 base plate and top riser to original floor level.

Bedroom 203
- Remove furred east wall and return to original location.
- Construct West Wing attic access hatch at west wall.

Attic 301
- Remove ducts and repair floor holes.
- Repair moved rafters.

Mechanical Systems

All existing plumbing fixtures and pipes would be removed from the house, and a new domestic water line would be installed from Grant Road. A new sewer line would essentially follow the route of the existing sewer line to the west property line. The cottage office and the barn can be connected to the same line. Sewer service cannot be directed to Whitehaven Drive as topography and the

Prairie Spring impede installation. The existing serviceable gas line would be stubbed into the new basement utility room in case its future use is required.

The existing forced-air system including furnaces, ducts, and registers would be removed from the house. Space heating would be provided by a combination of two electric radiant heat sources. In first floor spaces where wall and ceiling finishes have been removed, electric resistance coils can be embedded into new plaster finishes to provide radiant heating. An alternative is to install an electric or low pressure water radiant heating system in the cavity formed between the double floor system. This type of radiant system can be located in the ceilings of 101, the Hunt Addition, and the East Wing. An alternative system for the reconstructed portions of the house is to provide forced-air heating and cooling. The cooling can be provided by exterior conventional condenser units, or heating and cooling can be provided by a geothermal which would eliminate the necessity of a condenser unit.

In those rooms in which existing plaster is to remain intact or where general tours would not be allowed, portable floor electric resistance units would be freely placed within the spaces. Rooms of this type include 104, 201, and 203. Electric outlets providing 220 volts of service would be placed in discrete or concealed locations to power the heaters.

Electric radiant heat affords several advantages over forced-air including:

1. Ducts can be removed and walls returned to original placement.
2. Wall and floor registers can be removed, and the surfaces returned to near original appearance.
3. Comfort level can be adjusted for each space.
4. Duct noise is reduced or eliminated.
5. If temperature levels are maintained at between 55 and 60 degrees Fahrenheit during heating months, the air would not become as dry as that of forced-air systems. This would allow the building materials to remain in equilibrium with the ambient air much more so than with forced-air.
6. Visitors would be able to experience the feel of radiant heat much like that produced by an operating fireplace, rather than circulating air produced by forced-air systems.

Disadvantages in using radiant heat include:

1. Higher utility costs in using electric over natural gas. But high heating costs would be reduced by the fact that the bulk of the house would not be cooled during the summer.
2. The inability to filter dust from the air. If furniture or exhibits are placed in the house a daily dusting regimen may be required. It is strongly recommended that original furnishings or artifacts affected by temperature and humidity swings not be displayed in the house, if any original items are acquired in the future.

3. Cool spots and drafts would be noticeable, but visitors would only be in the house approximately 20 minutes and would be wearing their coats. However, visitors would be able to "experience" residential heating from a nineteenth century point-of-view.
4. The appearance of portable units within spaces may raise questions from visitors about historic appearance. But that question could be countered with a statement that the heating system was selected with the primary goal of preserving the historic fabric and not providing human comfort.

One other issue concerning the recommendation for disuse of a forced-air system needs to be addressed. Central air conditioning would not be possible because existing ducts would be eliminated. However, it is strongly believed by this author that air conditioning of historic house museums presents several disadvantages. Air conditioning is more or less installed for the comfort of visitors and control of airborne dust and contaminants. While controlled temperature and humidity levels also effectively conserve exhibited furnishings and artifacts, forced-air systems do not necessarily assist in the long-term preservation of the structure, and in fact can promote deterioration of historic fabric. After all, the house survived for 100 years with wood heat and 25 years with hot water radiant heat. Although there has been no detectable deterioration of historic fabric with operation of the existing central air system since 1940, there was no winter humidity control.

Operation of a central air system would not present a true picture of nineteenth century life. With central air, windows remain closed during the summer at a time when nineteenth century residents frequently opened windows to direct cooling breezes, and shutters usually remain open at a time when occupants operated them to shade direct sunlight. Closing the windows also segregates visitors from the sounds and smells of the surrounding yard. Flying insects and dust would become a common occurrence at the interior during warm days when the windows are open. But infiltration of outside elements also occurred during Grant ownership.

A forced-air heating and cooling system would be installed in the restored Hunt Addition and East Wing rooms. Wall and ceiling systems in these areas would be detailed to include a vapor barrier and insulation since the construction is new.

Fire Suppression System

A fire suppression system would be installed. While the protection of visitors and employees from fire is paramount, structural protection is also an essential goal as the house is the centerpiece of the historic site. Installation of the system would require selective removal of finishes to access wall and ceiling cavities. The following types of systems were considered for the house:

- Room by room , cross-zoned, pre-action deluge sprinkler system
- Room by room, cross-zoned, pre-action Halon substitute (Inergen) system
- Partial wet/dry pre-action systems.

- Single zone dry pipe sprinkler system.[436]

Of the above systems the single zone dry pipe sprinkler system would best serve the Main House. Zoning the system from room to room would complicate installation and operation. A wet pipe system is susceptible to freezing, especially in this structure. A gas suppression system would require storage space for an enormous number of tanks in the basement and elsewhere to make that system feasible for the Main House. The ceiling sprinkler heads would be flush mounted where supply pipes can be installed without substantial removal of historic ceiling or floor finishes. Wall mounted heads would be installed in lieu of ceiling heads. All pipes would be of copper to increase the longevity of the system and reduce the diameter of the supply pipes. Multiple risers would decrease pipe diameters and therefore allow for easier installation and less damage to historic fabric.

Consideration should be made for installing sprinkler heads at porch ceilings. While the probability for the occurrence of fire at porches is low, it must be understood that the site may be accessible and vulnerable to after-hours vandals if the site perimeter fence and gates are modified in the future. The porch sprinkler heads cannot be concealed flush with ceiling finishes which raises the issue of aesthetic appearance.

A new large diameter pipe would need to installed to the house from Grant Road to provide water to the sprinkler system. The control valve can be located in rebuilt basement Room 001 or in the Hunt Addition or East Wing basements.

Electrical System

The entire electrical system would be removed. Power would be supplied to a minimum of outlets required to maintain the structure and assist with minimum interior lighting or exhibits. Underground service installed to the Workshop in 1992 was located and designed to be adapted for house use. However, the service would need to be upgraded to 400 amp service from the current 200 amp service, but the existing conduit is adaptable. The existing aerial electrical service line and fuse box would be removed upon operation of the new underground service.

Hardwired fire and intrusion detection and alarm systems would be installed throughout the structure. A combination infrared and motion intrusion detector would be used in lieu of door and window contacts to prevent frequent false alarms. Panels for these systems would be placed in basement Room 001.

A certified lightning protection would be installed on the Main House. The system would be installed concurrent with the new roofing system at the exterior roof surface on the north and east faces.

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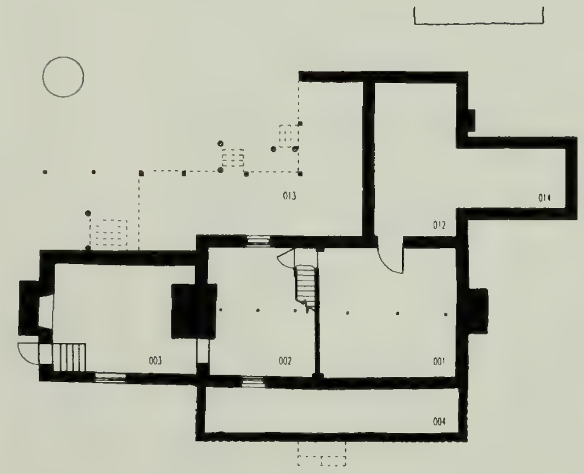
[436] HA, *MEP*, 5.

Cost Estimate

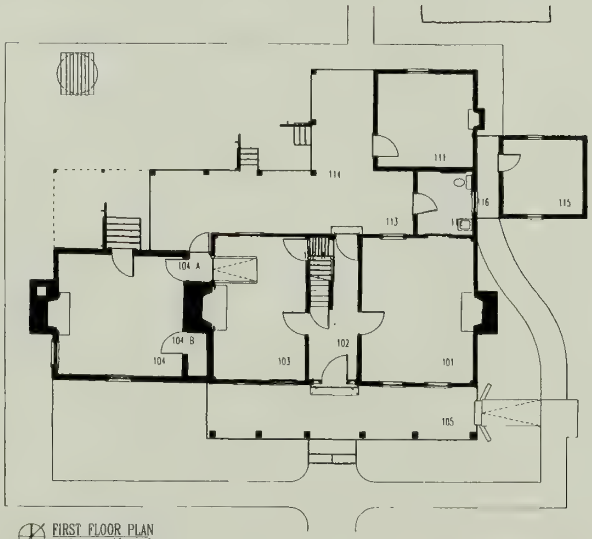
Main House (HS-1)
Treatment Alternative 2 - 1860 Restoration
Ulysses S. Grant NHS

The following table summarizes Class B cost estimates associated with the restoration of the Main House to an approximate date of 1860. In general, the historic fabric of the core area of the existing structure would be preserved as much as possible, while additions removed during 1940 renovation work would be reconstructed. All work is assumed to be accomplished by contract labor. These estimates reflect 1995 costs for completion of the proposed alternative. If implementation of a proposed treatment is delayed, the following figures must be reviewed and revised on an annual basis to include cost adjustments for material and services inflation.

Category	**Description**	**Cost**
Site	Grading, walks, tree removal, seeding	$22,200.00
Foundation	Foundation removal, shoring, excavation, new foundations, pointing existing stone, waterproofing, perimeter drainage, chimney repair and seismic stabilization	$245,500.00
Exterior	Construct additions and porch, roofing, gutters and downspouts, siding and porch repair, paint	$120,000.00
Structure	Selective demolition, framing repair and replacement, seismic reinforcement	$88,000.00
Doors	Repair existing doors, hardware repair and replacement, paint	$28,300.00
Windows & Shutters	Selective removal, repair and reconstruction, hardware, painting	$45,600.00
Interior Finishes	Wall, floor and finish selective demolition, mechanical and electrical removal, plastering, millwork, painting	$54,500.00
Mechanical	Water supply, waste lines, restroom, heating system, fire suppression system, water pump	$223,400.00
Electrical	Pole removal, service modifications, electrical and lighting systems, lightning protection	$98,000.00
Security	Intrusion detection and alarm, fire detection and alarm	$10,300.00
	Subtotal	$935,800.00
General Conditions	Insurance, temporary utilities, mobilization, equipment (10%)	$93,580.00
	Subtotal	$1,029,380.00
	Profit and Overhead (15%)	$154,407.00
	Subtotal	$1,183,787.00
	Contingency (20%)	$236,757.40
	Total (Construction)	$1,420,544.40
A/E Title II	Structural, mechanical, and electrical construction documents	$56,148.00
WASO Contingency	(31%)	$440,368.76
Archeology	Archeological mitigation	$60,000.00
	Total (Construction, Design, Inspection, Archeology)	$1,977,061.16


001
002
003
004
012
013
014

BASEMENT FLOOR PLAN
SCALE 1/8" = 1'-0"
0 1 5 10


101
102
103
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104 A
104 B
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FIRST FLOOR PLAN
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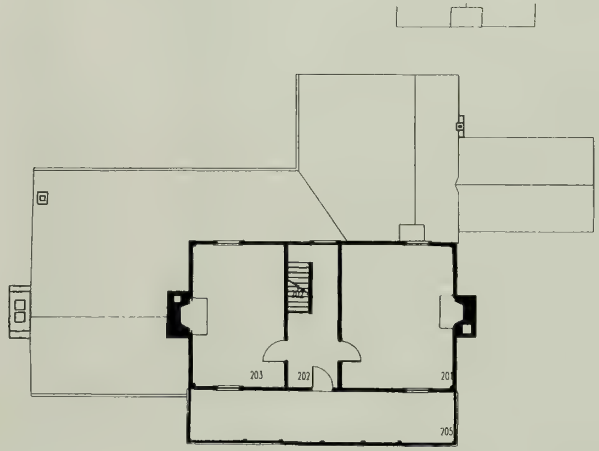
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SECOND FLOOR PLAN
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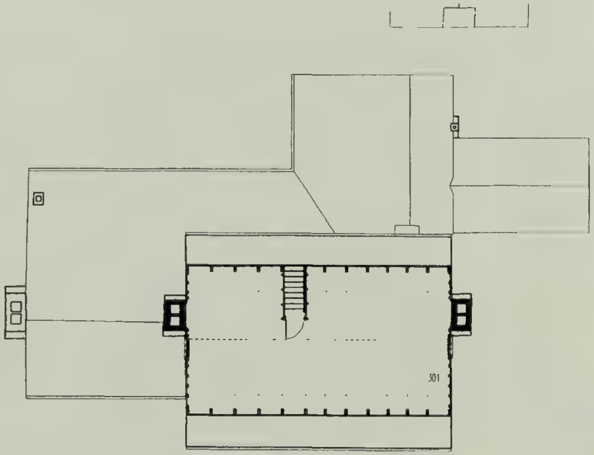

ATTIC FLOOR PLAN
SCALE 1/8" = 1' 0"
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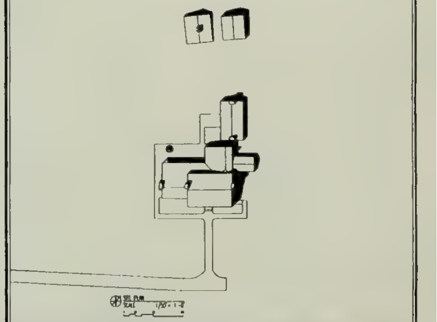
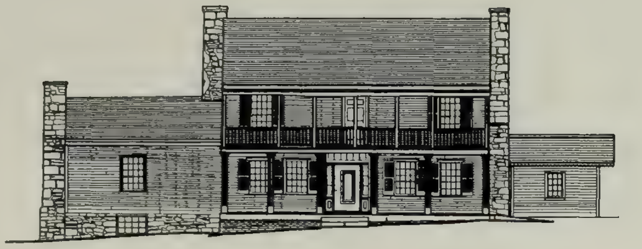
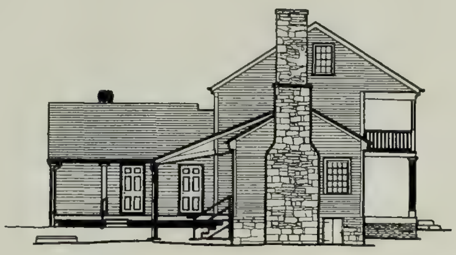
NOTES.


SITE PLAN
SCALE

SHEET TITLE PRELIMINARY DESIGN HS 1 ALTERNATIVE 2: 1860 WHITE HAVEN ULYSSES S GRANT NHS ST LOUIS, MO	DESIGNED	DRAWING NO 357/80006
	DRAWN K R MAROLF TECH REV A W O'BRIGHT	AUTOCAD FILE WHTAFP02
	DATE 01/15/93	SHEET 5 OF 10


SOUTH ELEVATION
SCALE 1/8" = 1'-0"


WEST ELEVATION
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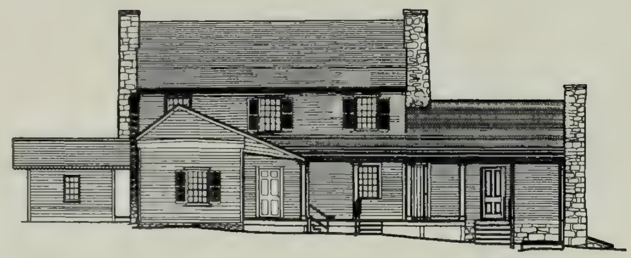
NORTH ELEVATION
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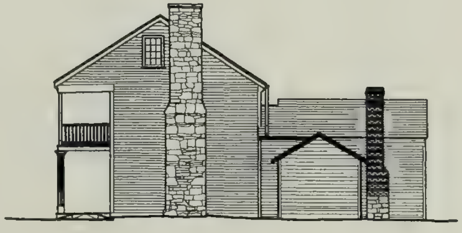
EAST ELEVATION
SCALE 1/8" = 1'-0"

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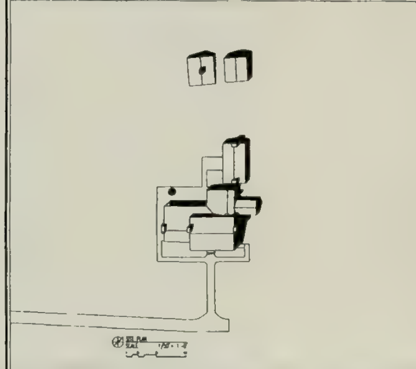


SHEET TITLE
PRELIMINARY DESIGN ELEVATIONS
ALTERNATIVE 2 1860
WHITE HAVEN
ULYSSES S GRANT NHS
ST LOUIS, MO

DESIGNED

DRAWN
K R MAROLF
TECH REV
A W O BRIGHT

DATE
10/13/92

DRAWING NO
357/80005

AUTOCAD FILE
WHTAEE02

SHEET 6
OF 10

Treatment Alternative 3 - 1875 Restoration

This treatment acknowledges all periods of Ulysses' and Julia's involvement with the site. Therefore, this alternative proposes to restore the building to a period when Grant was most active in managing the farm, when he began to purchase the property until just prior to his virtual disinterest in the property at the close of the 1875 Whiskey Ring Scandal. However, while Grant may have expected to retire to White Haven at the close of his military and then political careers, he apparently chose to reside in Wish-ton-wish during visits to the farm, and not stay at the Main House. Grant instructed that the Main House serve as tenant quarters, and he therefore had little input in alterations and decoration of the house.

Restoration of the house to this period is possible given the amount of graphic and photographic documentation and physical evidence available today. Through this evidence it has been determined that the house remained virtually unchanged from the time Ulysses purchased White Haven in 1865 until demolition of early building additions in 1940.

The title of this treatment alternative, restoration, does not imply restoration in a strict sense. The recommended treatment would include an amalgam of partial reconstruction, preservation, and repair techniques to achieve the goal of presenting the house at the stated time period while allowing for compromises which would assist in the perpetuation of historic fabric. But however great a quantity of evidence is available, an exact copy of the structure at any one point in time is not possible. There are always details which cannot be mastered as the information is not always present.

Many of the recommended treatments presented in this alternative parallel those found in Alternative 2, particularly with respect to the historic core of the building. To that end, a concept of preservation would be enforced in treating the remaining historic fabric of the structure. Unfortunately, some historic fabric would inevitably be lost in this alternative during the course of construction. Only through strong control of the design and construction processes would a minimum of historic material be lost.

Except for the inclusion of HABS Room 4, possible interpretive circulation modifications, and color changes, Alternative 3 recommendations parallel Alternative 2 recommendations. Therefore, the following specific recommendations are revisions or additions to those presented in Alternative 2 above.

Interior Use

Same treatment as prescribed for Alternative 2 except that HABS Room 4, the kitchen, could be adapted for use as a refuge for interpreters and ill visitors. The room would also have the advantage that windows overlook the direction visitors would approach the house. The room could also be featured as part of visitor circulation route.

Accessibility

See Alternative 2.

Site
See Alternative 2.

Asbestos
See Alternative 2.

Foundation
See Alternative 2.

Wall Structural Systems
See Alternative 2 .

Floor Structural Systems
The existing Room 106 floor would be removed and its level returned to the pre-1940 condition. All framing shall be of new members.

Roof Systems
See Alternative 2.

Exterior Cladding, Trim, and Finishes
Exterior millwork would be repaired, and deteriorated millwork replaced. The exterior of the house would be painted in a two-tone green, reflecting the color scheme believed to have been applied to the house in 1874.

Lead Paint Removal
See Alternative 2.

Porches
The deteriorated front porch would be dismantled and rebuilt using as much historic fabric as possible. The rear porch would be rebuilt to the appearance seen in 1913 photographs of the rear of the house (Figures 2.12 and 2.13).

Chimneys and Fireplaces
See Alternative 2.

Doors
See Alternative 2 in addition to the following recommendations:

104-D3

- Reconstruct new door leaf to match Stone Building Door D-2.

106 (HABS Room 4) doors

- Construct to match Stone Building Door D-2. Trim shall match salvaged trim from the room.

Windows

See Alternative 2 in addition to the following:

106 (HABS Room 4) windows

- Size and detail to match salvaged trim from the room.

Shutters

Existing shutters would be salvaged and stored. New operable shutters would be fabricated for windows requiring them. New cast iron hinges and catches would be installed. Although the color of the historic shutters is unknown, shutters would be painted dark green to match exterior trim.

Interior Finishes

See Alternative 2 in addition to the following:

Kitchen 106

- Return floor to original level.
- Replaster failed ceiling.
- Return east wall, windows, and doors to original location.

Mechanical Systems

See Alternative 2.

Fire Suppression System

See Alternative 2.

Electrical System

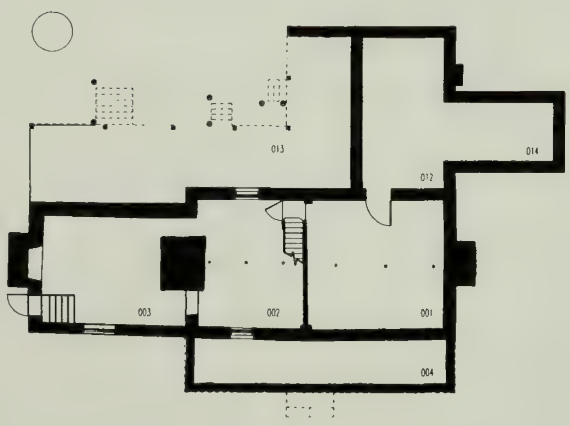
See Alternative 2.

Cost Estimate

Main House (HS-1)
Treatment Alternative 3 - 1875 Restoration
Ulysses S. Grant NHS

The following table summarizes Class B cost estimates associated with the restoration of the Main House to an 1875 appearance. In general, the historic fabric of the core area of the existing structure would be preserved as much as possible, while additions removed during 1940 renovation work would be reconstructed. All work is assumed to be accomplished by contract labor. These estimates reflect 1995 costs for completion of the proposed alternative. If implementation of a proposed treatment is delayed, the following figures must be reviewed and revised on an annual basis to include cost adjustments for material and services inflation.

Category	Description	Cost
Site	Grading, walks, tree removal, seeding	$22,200.00
Foundation	Foundation removal, shoring, excavation, new foundations, pointing existing stone, waterproofing, perimeter drainage, chimney repair and seismic stabilization	$245,500.00
Exterior	Construct additions and porch, roofing, gutters and downspouts, siding and porch repair, paint	$136,200.00
Structure	Selective demolition, framing repair and replacement, seismic reinforcement	$88,000.00
Doors	Repair existing doors,hardware repair and replacement, paint	$32,600.00
Windows & Shutters	Selective removal, repair and reconstruction, hardware, painting	$50,300.00
Interior Finishes	Wall, floor and finish selective demolition, mechanical and electrical removal, plastering, millwork, painting	$57,400.00
Mechanical	Water supply, waster lines, restroom, geothermal heating system, fire suppression system, water pump	$223,400.00
Electrical	Pole removal, service modifications, electrical and lighting systems, lightning protection	$98,000.00
Security	Intrusion detection and alarm, fire detection and alarm	$10,300.00
	Subtotal	$963,900.00
General Conditions	Insurance, temporary utilities, mobilization, equipment (10%)	$96,390.00
	Subtotal	$1,060,290.00
	Profit and Overhead (15%)	$159,043.50
	Subtotal	$1,219,333.50
	Contingency (20%)	$243,866.70
	Total (Construction)	$1,463,200.20
A/E Title II	Structural, mechanical, and electrical construction documents	$57,834.00
WASO Contingency	(31%)	$453,592.06
Archeology	Archeological mitigation	$60,000.00
	Total (Construction, Design, Inspection, Archeology)	$2,034,626.26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BASEMENT FLOOR PLAN
SCALE 1/8" = 1'-0"
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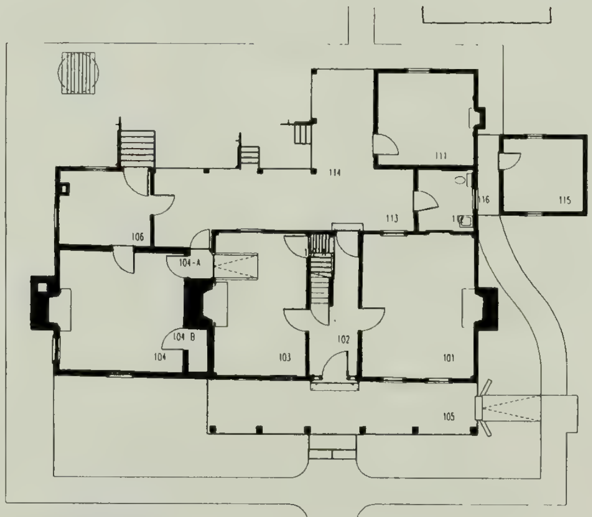
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104 B
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FIRST FLOOR PLAN
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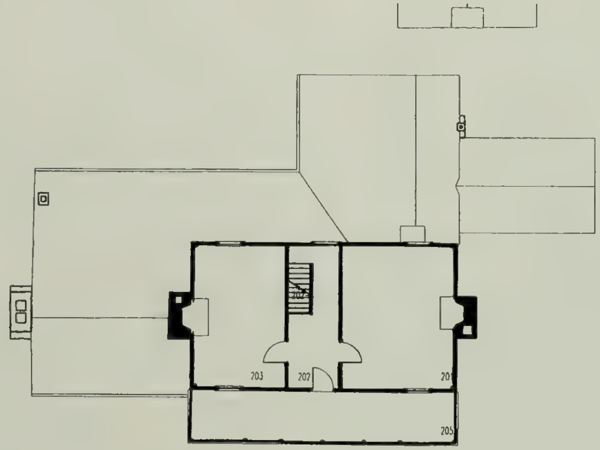
0 1 5 10


203
202
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SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"
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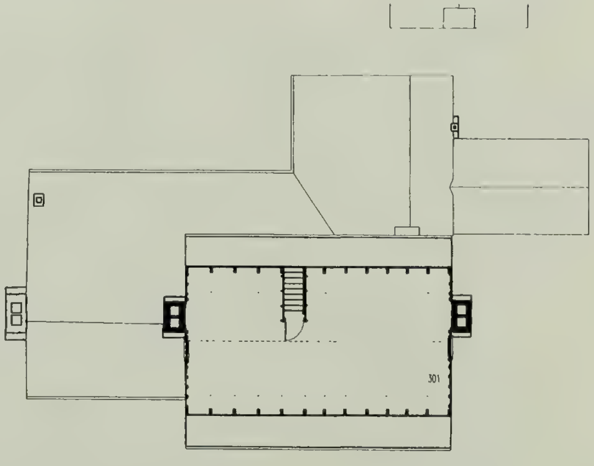
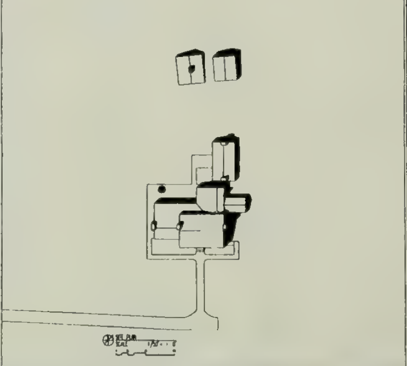
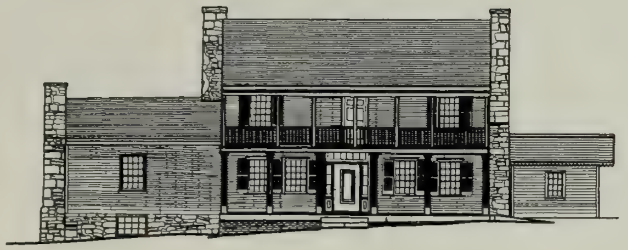


ATTIC FLOOR PLAN
SCALE 1/8" = 1'-0"
0 1 5 10

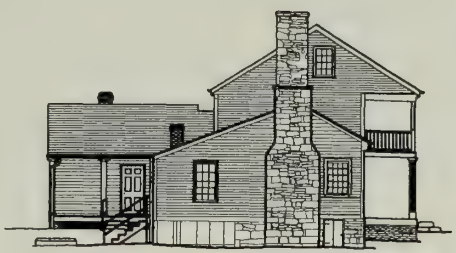
NOTES.



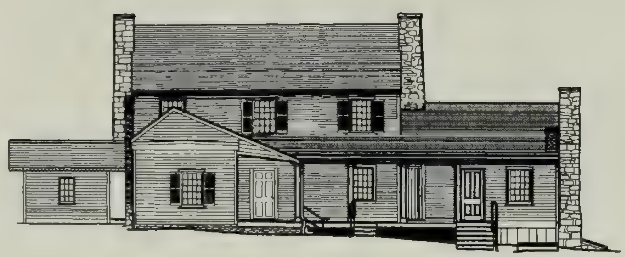
SHEET TITLE PRELIMINARY DESIGN HS-1 ALTERNATIVE 3: 1875 WHITE HAVEN ULYSSES S GRANT NHS ST LOUIS, MO	DESIGNED DRAWN K R MAROLF TECH REV A W O BRIGHT DATE 01/15/93	DRAWING NO 357/80006 AUTOCAD FILE WHTATP03 SHEET 7 OF 10



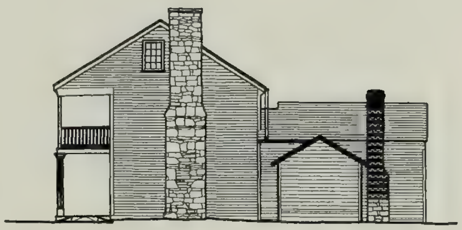
SOUTH ELEVATION
SCALE 1/8" = 1'-0"



WEST ELEVATION
SCALE 1/8" = 1'-0"

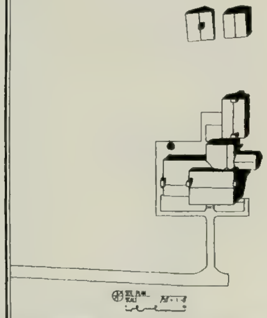


NORTH ELEVATION
SCALE 1/8" = 1'-0"



EAST ELEVATION
SCALE 1/8" = 1'-0"

NOTES



SHEET TITLE
PRELIMINARY DESIGN ELEVATIONS
ALTERNATIVE 3 1875
WHITE HAVEN
ULYSSES S GRANT NHS
ST LOUIS, MO

DESIGNED

DRAWN
K R MAROLF
TECH REV
A W O'BRIGHT

DATE
10/13/92

DRAWING NO
357/80006

AUTOCAD FILE
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OF 10

Treatment Alternative 4 - Interior Rehabilitation/Exterior Restoration
In this treatment the exterior of the house would be restored to an 1875 appearance, and the interior would be devoted to satisfying park administrative office space. The first and second floors would require extensive structural, mechanical, and electrical modifications before office functions would be moved into the house. Much historic fabric and interior character would be lost in providing for contemporary office space. Using the Site's principal historic structure for office space would also preclude much of the interior from being interpreted to visitors. The following addresses recommended treatments specific to building systems and elements to restore the exterior to an 1875 appearance similar to Alternative 3, and rehabilitate the interior for contemporary park offices.

Interior Use
With this alternative, most available spaces at the first and second floors will be rehabilitated as office space or ancillary office functions. Basement areas would be used as mechanical rooms and for storage space. Accessibility and egress requirements preclude the use of basement Room 104 as office space. Low head room limits the use of the attic (301) to light storage only. Extensive modifications would be required to rehabilitate the first and second floors of the remaining historic portion of the Main House for use as office space, while installation of contemporary systems within the new additions, the Hunt Addition and East Wing, would be relatively simple.

The following spaces would be offices; 101,102,104, 115, 201, and 202. Restrooms would be provided in 106 and 117.

Accessibility
The front and rear porches would be made accessible from grade for employees and the public. Extensive grading would be required in the south lawn to accommodate the front walk at a 1:12 slope. Handrails would be installed to each side of the walk as required by code for slopes of between 1:12 and 1: 20.

All first floor rooms would be made handicap accessible. The second floor can be made accessible but much viable floor space would be lost to installation of an elevator or stair lift. A permanent ramp would allow access at the floor level change between Rooms 103 and 104.

The existing stairs to the second floor would be removed and replaced with a new stair that complies with tread, riser, and handrail codes. The historic stair would be tagged and stored. The second floor structure, and first and second floor partitions and doors would be modified to accommodate the new stair.

Site
Remove vegetation that would be affected by foundation work. Remove tree branches overhanging the roof. Regrade and replace the front flagstone walk (see Accessibility). Swale the grade at the east elevation to drain surface water around the structure. An approved cultural landscape report should be completed prior to the planting of new trees.

Asbestos

All asbestos must be removed from the house prior to the commencement of substantial construction work.

Foundation

The existing foundation would be rebuilt to accommodate the more intensive office use. The foundations would be rebuilt with reinforced concrete to grade level, and reinforced stone from grade to the foundation sill. The basement floor level would be lowered to provide headroom for new mechanical systems.

Structural Framing Systems

Total replacement of the existing historic floor systems in the Long House, including structure and floor finishes, would be required to provide a 100 pounds per square foot live load office floor system. The new floors would also be level. Extensive modifications would be made to walls to ensure that floor structural systems have adequate bearing. The West Wing Room 104 floor system would be reinforced from the basement with a beam at midspan.

Roof Systems

The two existing dormers would be removed and new rafters installed to replace those that were severed to install the dormers. The roof structural system over Rooms 106 and 107 would be completely replaced. All roof sheathing would be replaced with spaced board sheathing to promote drying of wood shingles. New sawn wood shingles would be installed directly over the board sheathing. The shingles would be pressure treated with at least a Class C fire retardant.

Half-round gutters and smooth-round downspouts would be installed to direct water away from the structure. All valley and chimney flashing, and gutters and downspouts would be replaced with lead coated copper. Runoff would be directed to a new underground drain system similar to the existing, or leaders could be added to the downspouts to at least direct water away from the foundation.

Exterior Cladding, Trim, and Finishes

Any replacement or infill cladding shall match adjacent cladding as close as possible. The remainder of the cladding would be caulked and painted. Fascia boards would be replaced particularly at the second floor eaves. The exterior would be painted Paris green with dark green trim where identified in the paint analysis.

Lead Paint Removal

All painted surfaces at the interior and exterior would be stripped of paint. See Alternative 2.

Porches

See Alternative 3.

Chimneys and Fireplaces

See Alternative 2.

Doors

See Alternative 3.

Windows

All historic serviceable windows shall be repaired to operable condition to ensure smooth operation, and hardware added for security. All nonhistoric windows, including 101-W4, 101-W5, 201-W2, 203-W2, 203-W4, and 206-W1, would be removed and the resultant voids infilled. Broken glass and deteriorated glazing would be replaced. Window 101-W6 would be removed and returned to its previous position at present Door 103-D4. All first and second floor windows would receive interior storm windows to prevent drafts within office spaces.

Shutters

See Alternative 3.

Interior Finishes

Most of the plaster and lath finishes would be removed to facilitate installation of mechanical and electrical systems designed for an office environment. All floors in the Long House would be removed and replaced with a more stable floor system such as plywood. The historic floor in West Wing Room 104 would remain in place and a new level floor system would be installed covering the old floor. Carpet would be installed on all office and hallway floors. Resilient vinyl or ceramic tile would be installed in restrooms. Concrete floors would be placed in all basement rooms.

All interior millwork would be removed for stripping, then reinstalled were applicable. Deteriorated or undersized millwork would be replaced with new material matching the historic profiles.

Mechanical Systems

All existing plumbing fixtures and pipes would be removed and replaced with new materials. New water and waste lines would be routed to Grant Road.

Forced-air heating and cooling would remain active in the house, but the entire system would be replaced. A geothermal system would replace the existing gas fired furnace and air conditioner condenser units. Insulation would be installed in all perimeter wall and ceilings.

Fire Suppression System

A dry pipe fire suppression system would be installed (see Alternative 2 for details). There would be an unhindered installation of pipes since most interior finishes would be removed in this alternative.

Electrical System

The existing electrical system would be removed and replaced with a system designed for office functions. Underground service installed to the Workshop in 1992 was located and designed to be adapted for house use. The existing conduit is usable but power would be upgraded to 400 amp service. The existing aerial electrical service line and fuse box would be removed. All power lines will be in conduit. Outlets would be placed at all walls at the industry standard of four feet on center.

New overhead general lighting would be installed in each hallway and office. The lights would be incandescent rather than fluorescent to cast a warmer tone more conducive to a historic structure. The light fixtures would be of an elegant contemporary design and not emulate any particular historic period.

Hardwired fire and intrusion detection and alarm systems would be installed throughout the structure. A combination infrared and motion intrusion detector would be used in lieu of door and window contacts to prevent frequent false alarms. Panels for these systems would be placed in basement Room 012.

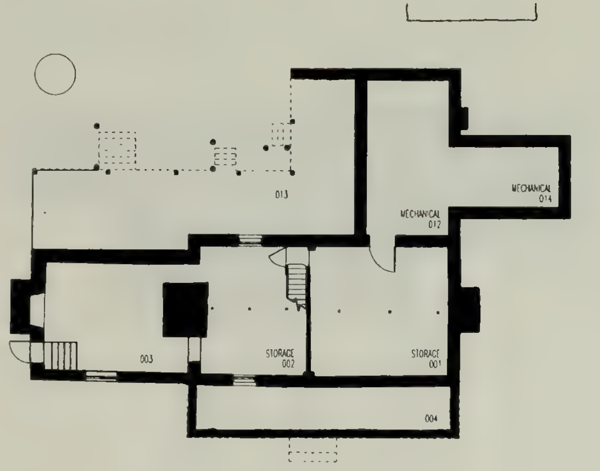
A certified lightning protection would be installed on the Main House. The system would be installed concurrent with the new roofing system at the exterior roof surface on the north and east faces.

Cost Estimate

Main House (HS-1)
Treatment Alternative 4 - Restore Exterior, Renovate Interior
Ulysses S. Grant NHS

The following table summarizes Class B cost estimates for the exterior restoration of Main House to an 1875 appearance, and renovation of the interior for use as park offices. The historic fabric of the core area of the existing structure would be preserved as much as possible. Additions removed during 1940 renovation work would be reconstructed. All work is assumed to be accomplished by contract labor. These estimates reflect 1995 costs for completion of the proposed alternative. If implementation of a proposed treatment is delayed, the following figures must be reviewed and revised on an annual basis to include cost adjustments for material and services inflation.

Category	**Description**	**Cost**
Site	Grading, walks, tree removal, seeding, front walk handrails	$28,000.00
Foundation	Foundation removal, shoring, excavation, new foundations, pointing existing stone, waterproofing, perimeter drainage, chimney repair and seismic stabilization	$250,000.00
Exterior	Construct additions and rear porch, roofing, gutters and downspouts, siding and porch repair, painting	$136,200.00
Structure	Selective demolition, framing repair and replacement, seismic reinforcement	$150,000.00
Doors	Repair existing doors, hardware repair and replacement, paint	$40,000.00
Windows & Shutters	Selective removal, repair and reconstruction, hardware, painting	$65,000.00
Interior Finishes	Wall, floor and finish selective demolition, floor replacement, mechanical and electrical removal, insulation, plastering, millwork, painting	$120,000.00
Mechanical	Water supply, waster lines, restroom, geothermal heating system, fire suppression system	$250,000.00
Electrical	Pole removal, service modifications, electrical and lighting systems, lightning protection	$120,000.00
Security	Intrusion detection and alarm, fire detection and alarm	$10,300.00
	Subtotal	$1,169,500.00
General Conditions	Insurance, temporary utilities, mobilization, equipment (10%)	$116,950.00
	Subtotal	$1,286,450.00
	Profit and Overhead (15%)	$192,967.50
	Subtotal	$1,479,417.50
	Contingency (15%)	$221,912.63
	Total (Construction)	$1,701,330.13
A/E Title II	Structural, mechanical, and electrical construction documents	$70,170.00
WASO Contingency	(31%)	$527,412.34
Archeology	Archeological mitigation	$50,000.00
	Total (Construction, Design, Inspection, Archeology)	$2,348,912.46


013
MECHANICAL 012
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STORAGE 001
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BASEMENT FLOOR PLAN
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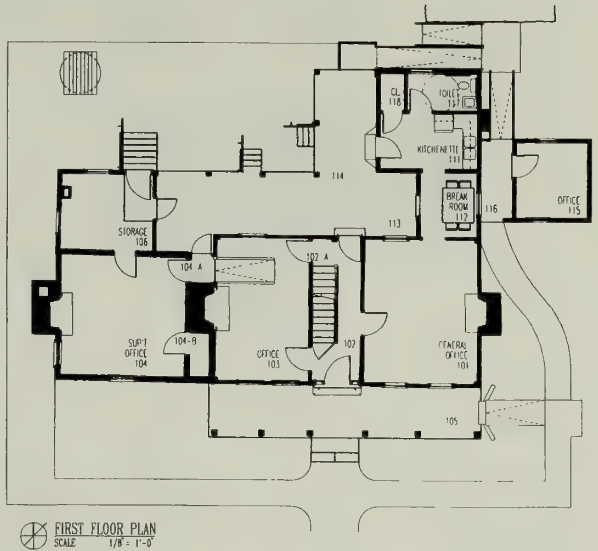
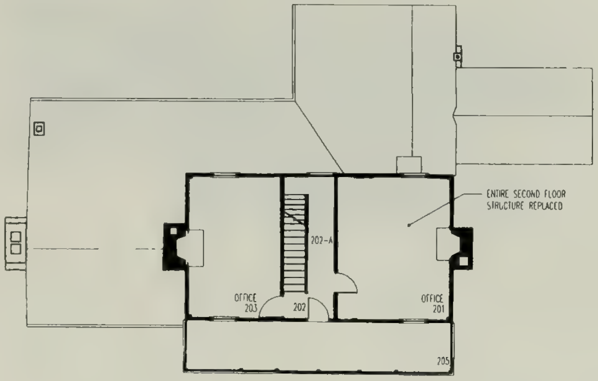

OFFICE 115
116
TOILET 117
CL 118
KITCHENETTE 111
BREAK ROOM 112
114
113
STORAGE 106
104 A
102 A
SUP'T OFFICE 104
104-B
OFFICE 103
102
CENTRAL OFFICE 101
105

FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"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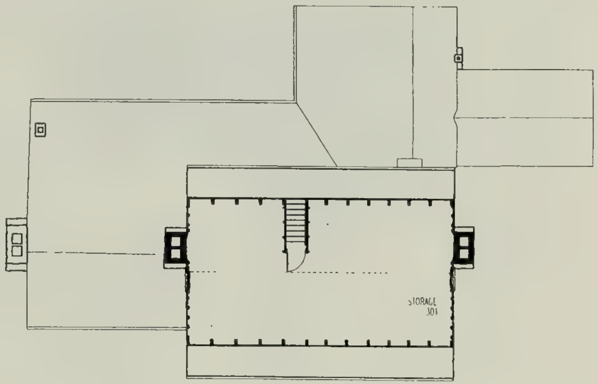
202-A
OFFICE 203
202
OFFICE 201
205

SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"


STORAGE 301

ATTIC FLOOR PLAN
SCALE 1/8" = 1'-0"

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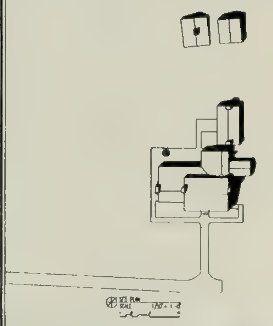
SITE PLAN
SCALE

SHEET TITLE
PRELIMINARY DESIGN HS 1
ALTERNATIVE 3 OFFICE/1875
WHITE HAVEN
ULYSSES S GRANT NHS
ST LOUIS, MO

DESIGNED

DRAWN
L M JOHNSON
TECH REV
A W O'BRIGHT

DAT
04/26/95

DRAWING NO
357/80006

AUTOCAD FILE
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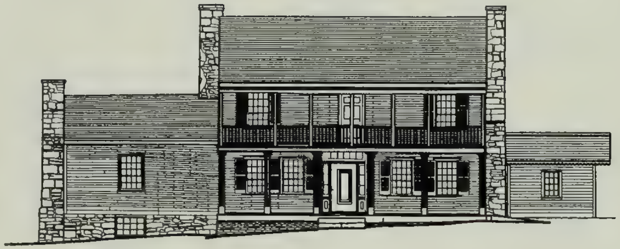
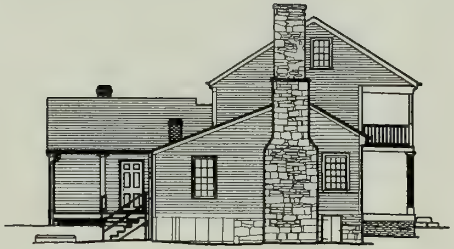
SHEET 9
OF 10



SOUTH ELEVATION
SCALE 1/8" = 1'-0"
0 1 5 10



WEST ELEVATION
SCALE 1/8" = 1'-0"
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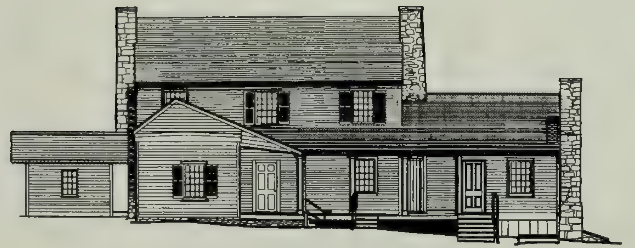

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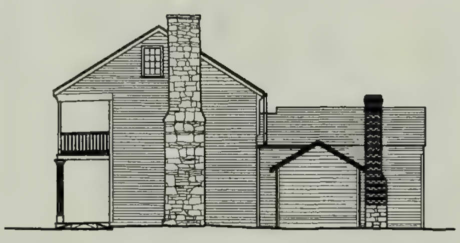

EAST ELEVATION
SCALE 1/8" - 1'-0"
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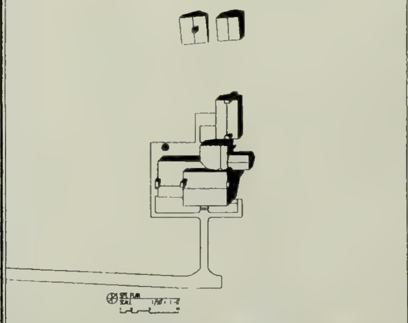
NOTES.



SHEET TITLE
PRELIMINARY DESIGN ELEVATIONS
ALTERNATIVE 4: OFFICE/1875
WHITE HAVEN
ULYSSES S GRANT NHS
ST LOUIS, MO

DESIGNED

DRAWN
L M JOHNSON
TECH REV
A W O'BRIGHT

DATE
04/26/95

DRAWING NO.
357/80006

AUTOCAD FILE
WHTAEE04

SHEET 10
OF 10

Treatment Alternative 5 - No Action

No action implies that the house would remain in its existing configuration, and treatment would be limited to cyclical and preventative maintenance. The interior would be swept and dusted, gutters and downspouts routinely cleaned on a regular basis. Mechanical and electrical systems brought to code compliance, roofs replaced as needed, and the exterior painted when required. The ground floor restroom would be repaired for use by the public and park staff. The central chimney stack and front porch would be repaired.

The following tables list immediate and long term costs associated with this alternative. However, other major work items may be required within the next twenty years due to unanticipated deterioration or damage caused by catastrophic events. It is anticipated that future treatment costs for major work items would be very high as the structure continues to age without the benefit of substantial repair work especially at the foundation and chimney stacks.

Immediate Repairs

Category	Description	Cost
Repair electrical system	Emergency lighting, general lighting, outlets	$5,000.00
Repair heating and cooling system	Replace furnaces, replace condenser units, repair ducts and registers	$6,500.00
Repair bathroom plumbing	Replace fixtures, install new water service	$3,500.00
Gutters and downspouts	Repair fascia as needed, install and paint gutters and downspouts	$4,000.00
Repair front porch	Replace deteriorated deck, repair structure, replace deteriorated trim	$20,000.00
Repair central chimney	Replace missing stone at crown	$7,000.00
	Total	$46,000.00

Routine and Cyclical Maintenance

Category	Description	Cost
Routine maintenance	Sweep floors, clean windows, dust millwork, clean gutters and downspouts, maintain heating system (per year)	$3,200.00
Paint exterior	Paint exterior siding, trim, windows and doors, caulk siding and reglaze windows (frequency: 8 years)	$12,000.00
Replace roof	Install asphalt shingles and flashing, replace deteriorated sheathing (frequency: 15 years)	$5,000.00

ULTIMATE USE AND DESIGN DEVELOPMENT

The above treatment alternatives for the Main House were presented during the park's General Management Plan team meetings conducted during 1993 and 1994. Five draft alternatives for treatment of the site were developed based in part upon information gathered on the historic structures. These alternatives were presented to the public in February 1994 for comment. In March 1994 the alternatives were presented to NPS Washington and Midwest Region Office professionals and the Missouri State Historic Preservation Office deputy director. The GMP team, the Washington Office, Missouri State Historic Preservation Office, and the public agreed that Treatment Alternative 3, restoration of the Main House to its 1875 appearance, was the most achievable over the other alternatives, given the available historic documentation and the goals for which the historic site was established. Selection of the treatment permitted a more intensive investigation of systems design and repair. More detailed drawings were developed based upon design refinement and are presented immediately after the text of this section. The following summarizes and refines recommended treatments presented in Treatment Alternative 3 for specific building systems and activities. A team approach was used to select alternative treatments. The multidisciplinary team is comprised of management, architectural, engineering, maintenance, and interpretive personnel.

Interior Use

The ground floor will be open and interpreted to the public. Rooms 101, 103, 104, 106, and the large Hunt Addition Room 111 will have unobtrusive exhibits rather than furnishings. The appearance and type of furnishings that may have been in the house around 1875 are unknown at this time. Since little is known about its interior, the small Hunt Addition Room 112 will serve as a public restroom accessible from the porch. The East Wing Room 115 will function as first aid and interpretation office. The basement Winter Kitchen 003 will be restored, but no visitors will be allowed in the space due to egress requirements. Basement Rooms 001 and 002 can serve as storage space, and mechanical space will be provided in Rooms 012 and 014. The second floor and attic will be closed to the public due to structural and accessibility considerations. No storage should be allowed on these two floors to prevent cracking of ceiling finishes in rooms below.

Visitor circulation will begin at the front door and move west after a visit through Room 101. Visitors will exit through the east door of Room 106 onto the rear porch where they will have an opportunity to enter the Hunt Addition and continue on to the Stone Building.

Accessibility

The flagstone walk leading to the front porch should be recontoured to maintain a 1:12 pitch, and handrails should not be installed. An alternative path which loops east of the Main House to the rear of the house will be accessible at a maximum pitch of 1:20. A ramp with handrails will be constructed between the Main House and Stone Building just off of the Hunt Addition Porch 114. This path is indicated in the General Management Plan for the site. A ramp will be installed at the east end of the front porch, a walk will branch from the flagstone walk to meet the ramp. Principal egress doors will have short ramps to negotiate the transition from porch decks to interior spaces.

A portable ramp will be available for installation at the transition between Exhibit Rooms 103 and 104. The ramp can be stored in Closet 104-B. A ramp will be constructed for access into the East Wing. East Wing Hall 116 will be wider than historic conditions to accommodate wheelchairs. The wide hall will be concealed from the principal view of the front of the Main House.

The second floor would be closed to visitors due in part to extremely steep historic stairs, combined with the intrusive affect on the historic character of structure should an elevator be installed. Likewise, the basement Winter Kitchen 003 would be closed to the public for similar reasons.

Site

Substantial excavation around the structure will necessitate removal of all shrubs and trees near the perimeter of the house.

Asbestos

Asbestos bearing building materials will be removed prior to general construction work. Plaster finishes must be removed from the walls opposite halls 102 and 202 to access ducts bearing asbestos based tape.

Archeology

Because new foundations and foundation stabilization work will require substantial excavation inside and outside of the walls, archeological excavations must take place prior to execution of the work. Of particular interest in terms of architectural features are the possible Hunt Addition remains beneath the existing breezeway, East Wing remains, the Winter Kitchen floor, and the front porch.

Foundation

Existing stone foundation walls will be stabilized and preserved. There was general agreement that the because the Winter Kitchen basement Room 003 is such a rare element, the effort will be made to preserve the existing walls. The work will require substantial excavation and construction of new concrete footings and sub-grade retaining wall to ensure seismic stability. Foundation sills will be anchored to the foundations. The Hunt Addition, East Wing, and eastern half of the Long House foundations will be constructed of cast-in-place concrete topped with limestone in those areas exposed to exterior view. A perimeter foundation drainage system terminating in the Prairie Spring shall be installed.

Structural Framing Systems

Historic framing will be repaired as necessary to retain as much of the historic fabric as possible. Lumber used for repairs shall match the physical characteristics of the historic lumber. Missing or deteriorated foundation sills will be hewn of the same material as removed. Sawn, dimensioned lumber will be used for new construction including the Hunt Addition, East Wing, and rear porch.

Roof Systems

All existing sheathing will be removed and replaced with skip board sheathing a minimum of 1 inch thick. Sheathing on the restored additions and back porch can be the same thickness. The shims installed in 1993 to level the south West Wing roof can remain in place although the plywood sheathing would be replaced. Sawn cedar shingles with a Class C fire rating shall cover all roofs. Gutters will be half round and downspouts smooth round of galvanized steel. All downspouts will empty into a sub-grade drainage system and be separate from the foundation drain system.

Exterior Cladding, Trim, and Finishes

Replacement and infill siding shall be of contemporary sawn redwood or cedar to differentiate the new material from the hand made historic siding. Replacement trim shall be of eastern white pine. All exterior paint finishes remaining after substantial exterior work shall be stripped to the substrate. Exterior siding shall be painted Paris green. Windows, doors, shutters, and trim would be dark green, and selected areas of the cornice black.

Porches

The front porch will have to be completely dismantled and rebuilt. Salvageable millwork will be marked, repaired, and reinstalled. New box posts will be detailed so that they can be removed for future repair and maintenance work.

Chimneys and Fireplaces

The east chimney will be totally dismantled and replaced unless a method can be developed to save the middle portion of the stack while replacing the base and crown. The center chimney stack will be removed to below the West Wing roof line and rebuilt. The west stack will be removed to just below the West Wing roof ridge and rebuilt. All chimney flues will be lined with steel reinforced lightweight grout to seismically stabilize them.

Doors

Existing historic doors will be repaired where practical. New doors will match the profile and construction of the historic doors.

Windows

Windows to remain will be repaired to operating condition. All flashing and other hardware will be removed. New windows will match the profile and construction of the historic windows. New windows shall be glazed with contemporary glass to differentiate the old glass from the new.

Shutters

All existing shutters and hardware will be removed; representative samples would be entered into park curatorial collections. New operable shutters configured to those seen in late nineteenth and early twentieth century photographs of the house shall be constructed. All hardware will be new. The single hand wrought pintle at Window 207-W1 will remain in place and be protected from weathering.

Interior Finishes

Nineteenth century wood lath systems will remain in place where in good condition. Existing plaster finishes in good condition shall remain in place. Repairs and infill shall be made with galvanized metal lath and plaster. Paint would be completely removed from all remaining surfaces including plaster finishes.

Paint analysis evidence suggests that walls and corner post casings in the Long House had been papered historically. Historic wallpapers have been documented only for Room 103. It is recommended that a study be initiated in conjunction with exhibit planning to determine the best course of action for finishing walls in first floor exhibit spaces. Until completion of that study, the walls and corner post casings should be painted a neutral tone. Room trim would be painted in accordance with a schedule to be developed, but for the most part first floor trim will parallel the dark green found on exterior trim of the house (see Appendix D, Paint Analysis).

All replacement millwork shall be made of eastern white pine. Moulding profiles shall match those of existing millwork as close as possible. All new millwork shall be date stamped at an inconspicuous surface. Chimney pieces would be removed and reset against wall framing rather than the plaster finishes as presently exists.

The 1940 top flooring shall be removed at the first floor in preparation for installation of sub-floor radiant heating systems (see Mechanical Systems). The second floor finish floor boards shall be removed in preparation for installation of conduit and fire suppression systems in the cavity between the floors. It is suspected that most of the removed flooring will be extensively damaged during removal. Replacement flooring shall match the character of the historic flooring. The boards would be seasoned in the house for at least 30 days prior to installation to equalize the moisture content.

Mechanical Systems

All existing plumbing systems shall be removed and replaced with new materials. New water and sewer service shall be installed from Grant Road.

The existing forced-air system, including furnaces and ducts, will be removed. The old duct chases can be used to route new fire suppression and electrical systems. Heating will only be provided through the use of a sub-floor radiant cable system in Rooms 101, 102, 103, 103, and 106. To provide auxiliary heat during extremely cold periods, 220 volt outlets will be installed beneath a selected brick of all fireplace hearths, except for the basement fireplace. Portable electric resistance heating units can be set up within the fireplaces as needed. There will be no mechanical cooling in the historic core of the house. Cooling will be provided through natural ventilation through open windows and doors. A power ceiling fan will be installed in the restroom, vented to East Wing Hall 116.

Existing insulation in wall and ceiling cavities of the historic core of the Main House should remain in place to prevent rapid heat lose during extremely cold weather. Since no humidifier is to be installed, there will be no undue moisture trapped within wall and ceiling cavities due to condensation. No vapor barrier will be installed. Dirty and damaged insulation will have to be replaced in the West Wing attic however.

A forced-air system will be installed in the Hunt Addition and East Wing. More controlled temperature levels in the Hunt Addition will provide an opportunity to install exhibit materials which may require moderate climate control. The system will provide a comfortable environment for the first aid and office in the East Wing and the restroom in the small Hunt Addition room. A branch of the forced-air system will be installed in basement Rooms 001 and 002 to promote ventilation, and supplemental heat for the first floor spaces and basement Winter Kitchen.

A closed-loop geothermal system will be installed to supply the forced-air system with cooling and heating energy. The geothermal system will be operated by electricity only. A series of deep holes just east of the Main House will be bored for installation of the plastic loop. This loop will provide for both the Main House and Stone Building mechanical systems. Although initial installation costs are about twice that of conventional systems, advantages of this system include: no exterior condenser unit nor chimney vent is required, the interior heat exchanger is compact and easily maintained, and operating expense is low due to the extreme efficiency of the unit.

Fire Suppression System

A single zone dry pipe fire suppression system will be installed through the structure. Concealed ceiling sprinkler heads will be principally installed in first floor exhibit spaces. Sidewall sprinkler heads will be installed in the Winter Kitchen 003 and second floor rooms. Basement and attic spaces will have the exposed pendant-type sprinkler heads.

Electrical System

A new electrical system will be installed throughout the building. Outlets for routine maintenance work will be concealed in inconspicuous locations. Electrical service for future exhibits can be run through the floor system if necessary. However, a concept plan for the exhibits must be completed so that electrical conduit and device locations can be designed and installed prior to floor construction. A new 400 amp service line will be run through existing underground conduit that must be partially moved from the Workshop.

Hardwired fire and intrusion detection systems will be placed throughout the house. Fire alarm pull stations will be located near each principal point of egress. Emergency strobe and horn units are required for each public room. These units will be located near the door head of principal egress routes. The security system key pad will be located in the East Wing First Aid/Office.

Simple, general lighting will be provided in each room near principal egress routes. The incandescent lamps will be wall mounted near door heads. These fixtures will also provide emergency lighting via a battery backup system located in the basement. Security site lighting is considered a General Management Plan issue; technical aspects of site lighting will be addressed upon resolution of the plan.

A lightning protection system will be installed on the Main House and trees close to the house. The system will probably require two rods at each chimney and along the roof ridge.

DESIGN DEVELOPMENT DRAWINGS

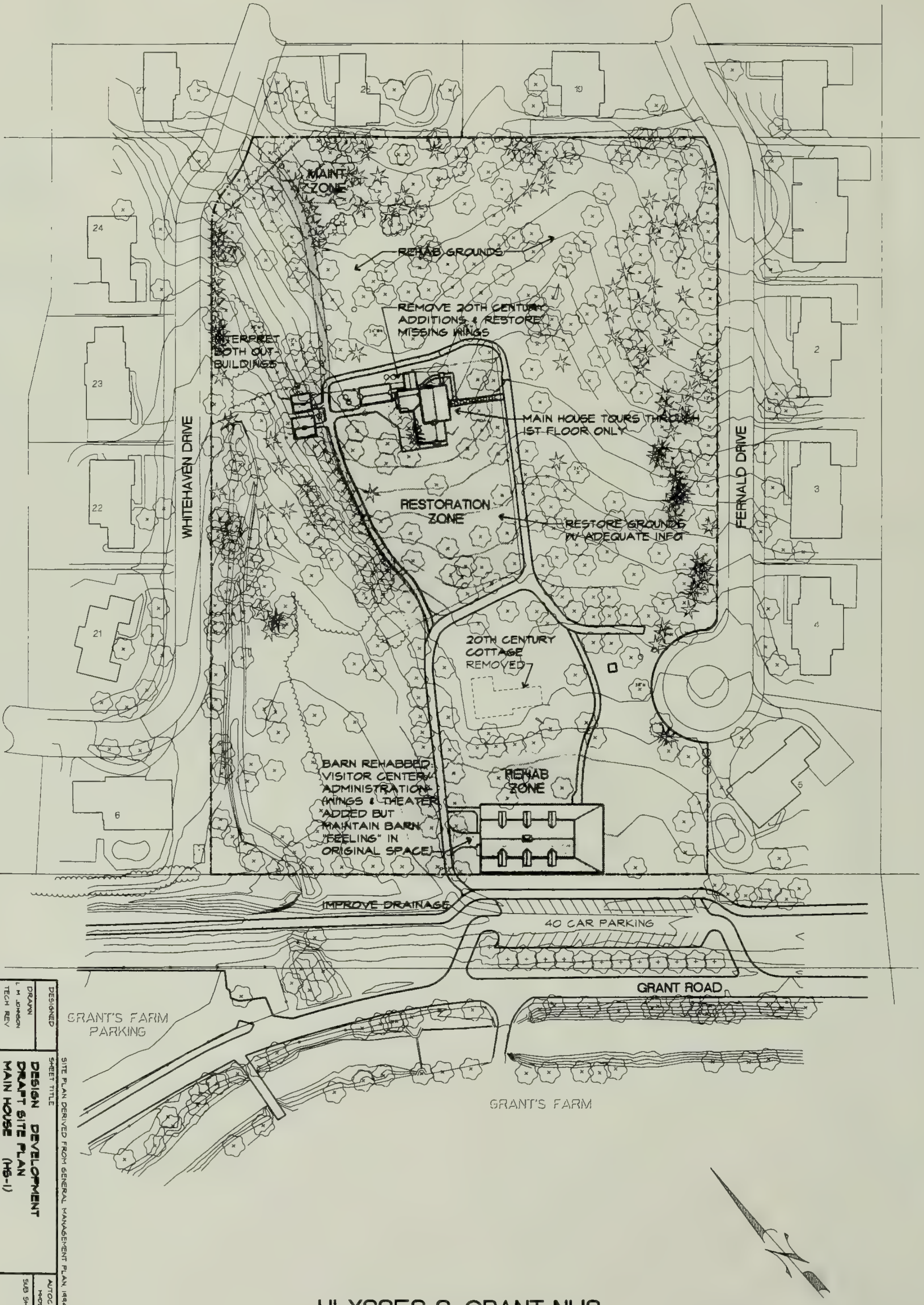
MAIN HOUSE (HS-1)
DESIGN DEVELOPMENT DRAWINGS
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS COUNTY, MISSOURI

LIST OF DRAWINGS

1	TITLE SHEET
2	SITE PLAN
3.	BASEMENT FLOOR PLAN
4	FIRST FLOOR PLAN
5.	SECOND FLOOR PLAN
6.	ATTIC FLOOR PLAN
7	ROOF PLAN
8.	BASEMENT REFLECTED CEILING PLAN
9	FIRST FLOOR REFLECTED CEILING PLAN
10	SECOND FLOOR REFLECTED CEILING PLAN
11	ATTIC REFLECTED CEILING PLAN
12.	HUNT ADDITION BUILDING SECTION
13	HUNT ADDITION BUILDING SECTION
14.	EAST WING ADDITION BUILDING SECTION
15.	SOUTH EXTERIOR ELEVATION
16.	WEST EXTERIOR ELEVATION
17	NORTH EXTERIOR ELEVATION
18	EAST EXTERIOR ELEVATION
19.	INTERIOR ELEVATIONS, ROOMS 001-003
20.	INTERIOR ELEVATIONS, ROOM 003
21.	INTERIOR ELEVATIONS, ROOMS 012-014
22	INTERIOR ELEVATIONS, ROOMS 101-103
23.	INTERIOR ELEVATIONS, ROOMS 103-104B
24	INTERIOR ELEVATIONS, ROOMS 106-114
25	INTERIOR ELEVATIONS, ROOMS 111-116
26	INTERIOR ELEVATIONS, ROOMS 201-203
27.	INTERIOR ELEVATIONS, ROOM 203-301
28	INTERIOR ELEVATIONS, ROOM 301
29	INTERIOR ELEVATIONS, ROOMS 002A & 202A

CONCURRED ASSOCIATE REGIONAL DIRECTOR DATE	RECOMMENDED SUPERINTENDENT DATE	DESIGNED	SHEET TITLE DESIGN DEVELOPMENT TITLE SHEET MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	AUTOCAD FILE MHDDCOVR	DRAWING NO 331/80007
APPROVED REGIONAL DIRECTOR DATE	CHIEF CULTURAL RESOURCES MANAGEMENT DATE	DRAWN L M JOHNSON TECH REV A M O'BRIGHT DATE JUNE 30 1994		SUB SHEET	SHEET 1 OF 29

DRAFT
SITE PLAN



REHAB GROUNDS
MAINT ZONE
REMOVE 20TH CENTURY ADDITIONS & RESTORE MISSING WINGS
INTERPRET BOTH OUT-BUILDINGS
MAIN HOUSE TOURS THROUGH 1ST FLOOR ONLY
RESTORATION ZONE
RESTORE GROUNDS W/ ADEQUATE INFO
WHITEHAVEN DRIVE
FERNALD DRIVE
20TH CENTURY COTTAGE REMOVED
REHAB ZONE
BARN REHABBED VISITOR CENTER/ ADMINISTRATION (WINGS & THEATER ADDED BUT MAINTAIN BARN "FEELING" IN ORIGINAL SPACE)
IMPROVE DRAINAGE
40 CAR PARKING
GRANT ROAD
GRANT'S FARM PARKING
GRANT'S FARM
27
25
19
24
23
22
21
6
2
3
4
5
50
25
0
50
100

ULYSSES S. GRANT NHS
ST. LOUIS, MISSOURI

SITE PLAN DERIVED FROM GENERAL MANAGEMENT PLAN, 1994

DESIGNED

DRAWN
L M JOHNSON

TECH REV
A R OBRIGHT

DATE
JUNE 30 1994

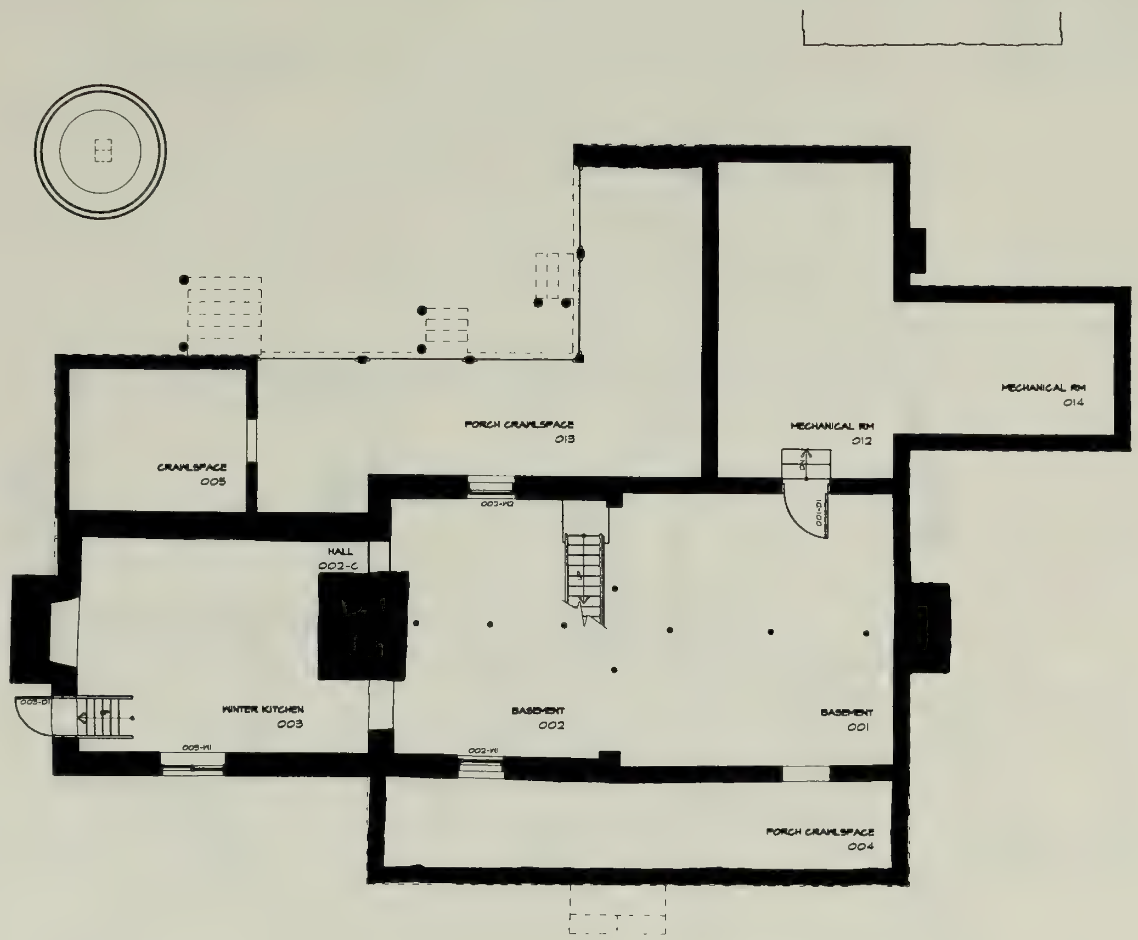
SHEET TITLE
DESIGN DEVELOPMENT
DRAFT SITE PLAN
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NHS
ST. LOUIS, MO

AUTOCAD FILE
MHDDSPO

SUB SHEET

DRAWING NO
351/80001

SHEET 2
OF 29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014
MECHANICAL RM
012
001-D1
UP
PORCH CRAWLSPACE
013
CRAWLSPACE
005
002-W2
HALL
002-C
BASEMENT
001
BASEMENT
002
WINTER KITCHEN
003
003-D1
003-W1
002-W1
PORCH CRAWLSPACE
004

BASEMENT FLOOR PLAN
SCALE 1/4" = 1'-0"
0 1 2 4 8

DESIGNED	SHEET TITLE	AUTOCAD FILE MHDDFP00	DRAWING NO 337/80007
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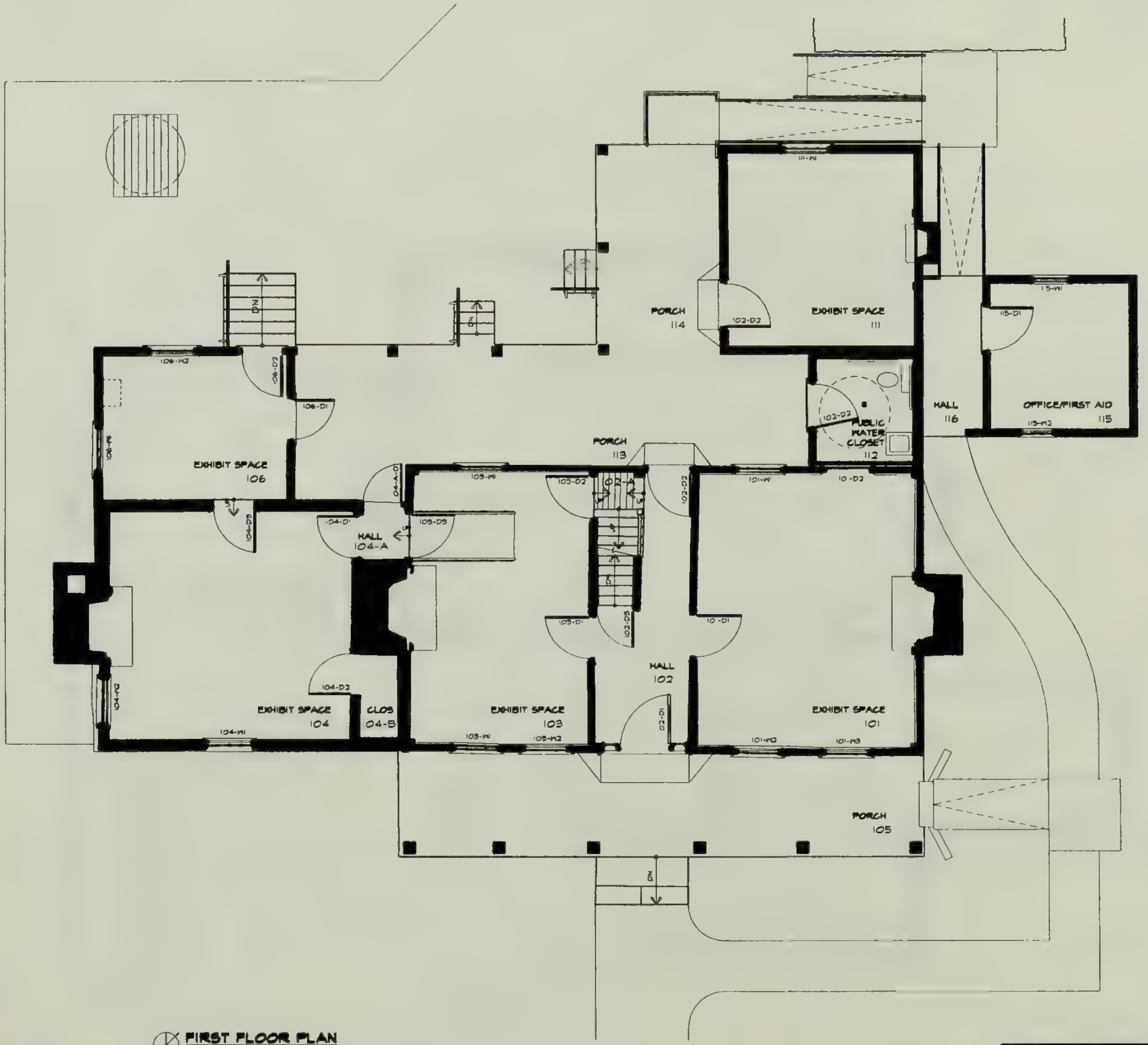
DATE JUNE 30 1994			OF 29


PORCH
114
EXHIBIT SPACE
111
111-W1
102-D2
HALL
116
OFFICE/FIRST AID
115
115-W1
115-D1
115-W2
PUBLIC
WATER
CLOSET
112
102-D2
PORCH
113
DN
DN
106-W2
106-D2
106-D1
106-W1
EXHIBIT SPACE
106
104-D3
04-A-D1
104-D1
HALL
104-A
103-D3
103-W1
103-D2
02-A
102-D2
101-W1
10 -D2
103-D1
102-D3
10 -D1
HALL
102
104-W2
104-D2
EXHIBIT SPACE
104
104-W1
CLOS
04-B
EXHIBIT SPACE
103
103-W1
103-W2
02-D1
EXHIBIT SPACE
101
101-W2
101-W3
PORCH
105
DN

FIRST FLOOR PLAN
SCALE 1/4" = 1'-0"

0 1 2 4 8

DESIGNED

DRAWN
L M JOHNSON
TECH REV
A M O'BRIGHT

DATE
JUNE 30 1994

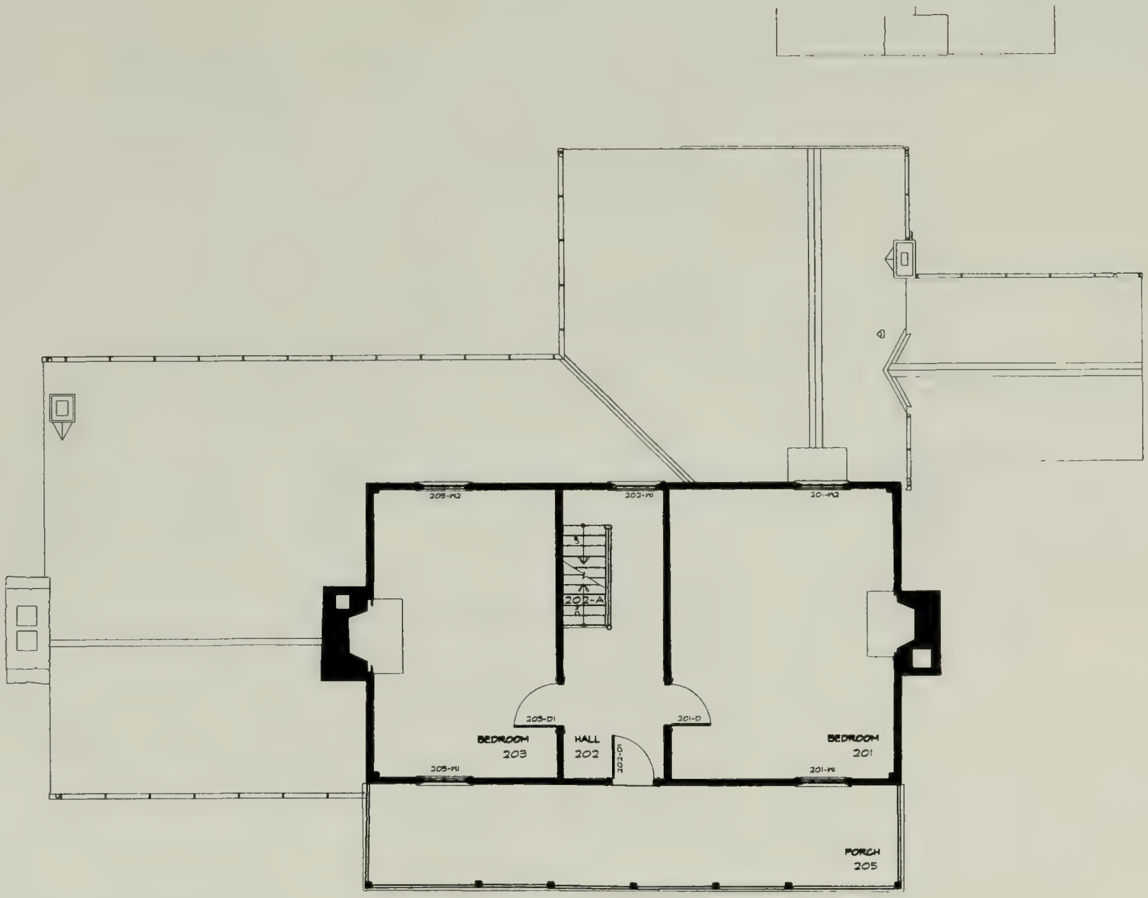
SHEET TITLE
DESIGN DEVELOPMENT
FIRST FLOOR PLAN
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NHS
ST. LOUIS, MO

AUTOCAD FILE.
MXDDFP01

SUB SHEET

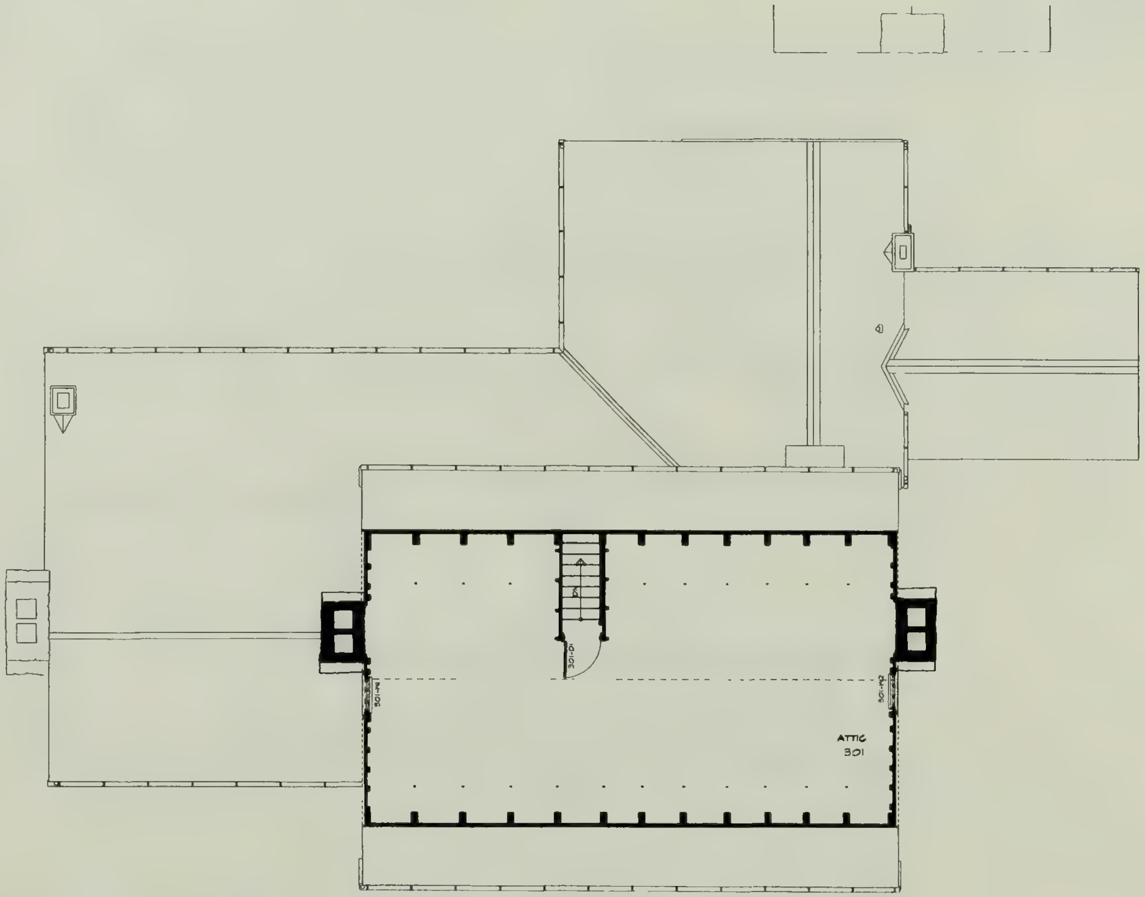
DRAWING NO
337/80007

SHEET 4
OF 29


203-W2
202-W1
201-W2
202-A
203-D1
201-D
202-D1
BEDROOM
203
HALL
202
BEDROOM
201
203-W1
201-W1
PORCH
205

SECOND FLOOR PLAN
SCALE 1/4" = 1'-0"

DESIGNED	SHEET TITLE DESIGN DEVELOPMENT SECOND FLOOR PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	AUTOCAD FILE: MHDDFP02	DRAWING NO 357/80007
DRAWN L M JOHNSON TECH REV A R O'BRIGHT		SUB SHEET	SHEET 5
DATE JUNE 30 1994			OF 29


301-D1
DN
301-W1
301-W2
ATTIC
301

ATTIC FLOOR PLAN

SCALE 1/4" = 1'-0"

0 1 2 4 8

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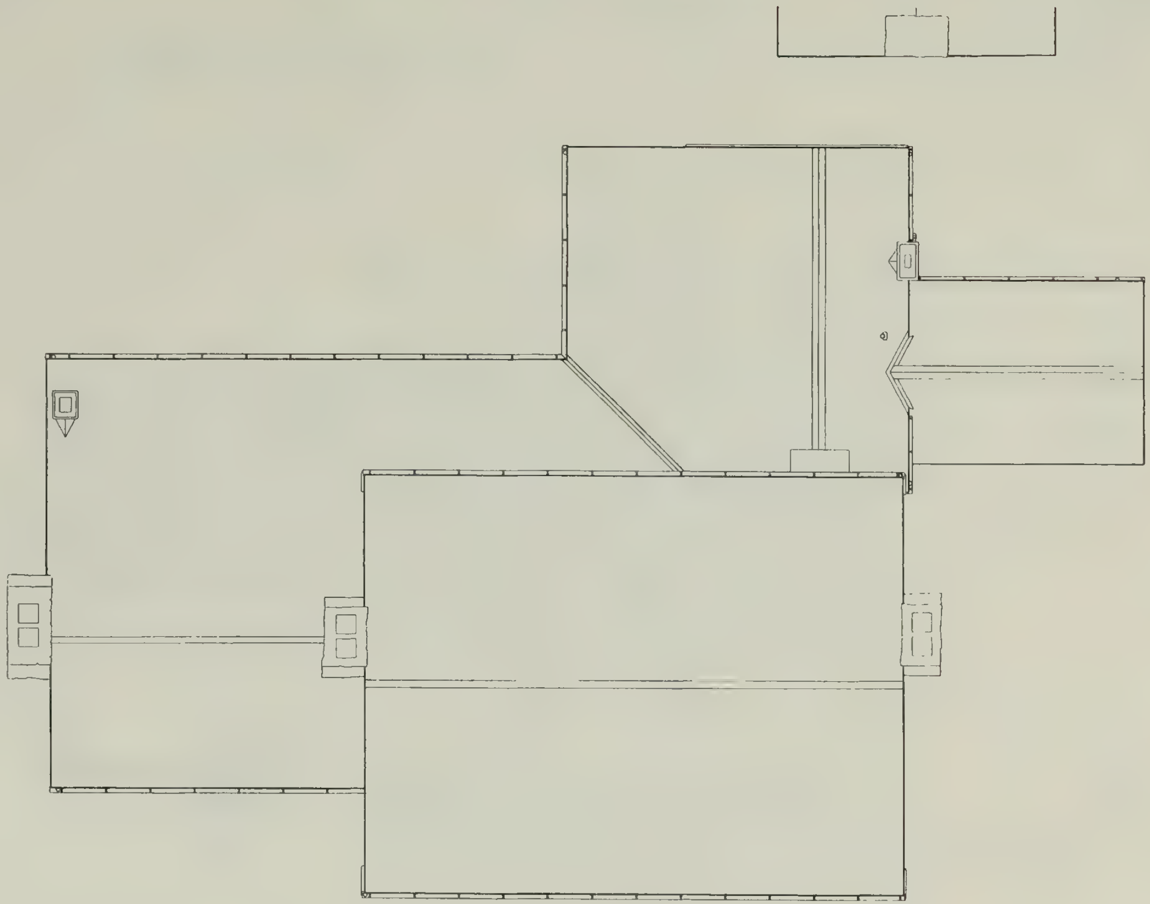
DATE JUNE 30 1994			



ROOF PLAN

SCALE /4 = 1'-0"

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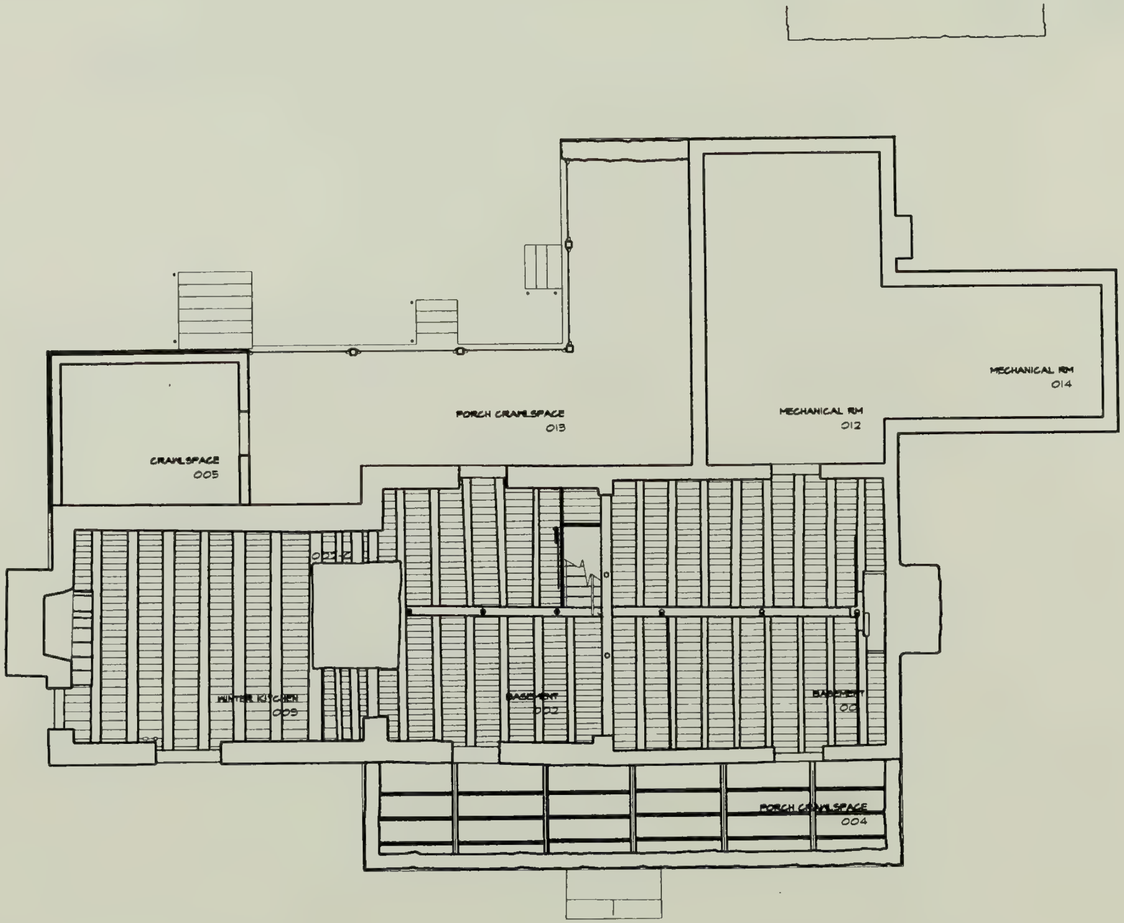
DRAWN L M JOHNSON TECH REV A R OBRIGHT		SUB SHEET	SHEET 7
DATE JUNE 30 1994			OF 29


MECHANICAL RM
014
MECHANICAL RM
012
PORCH CRAWLSPACE
013
CRAWLSPACE
005
WINTER KITCHEN
003
BASEMENT
002
BASEMENT
00
PORCH CRAWLSPACE
004

BASEMENT REFLECTED CEILING PLAN
SCALE 1/4" = 1'-0"
0 1 2 4 8

DESIGNED	SHEET TITLE	AUTOCAD FILE HHDDRC00	DRAWING NO 357/80007
DRAWN L M JOHNSON TECH REV A R O'BRIGHT DATE JUNE 30 1994	DESIGN DEVELOPMENT REFLECTED CEILING PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	SUB SHEET	SHEET 8 OF 29

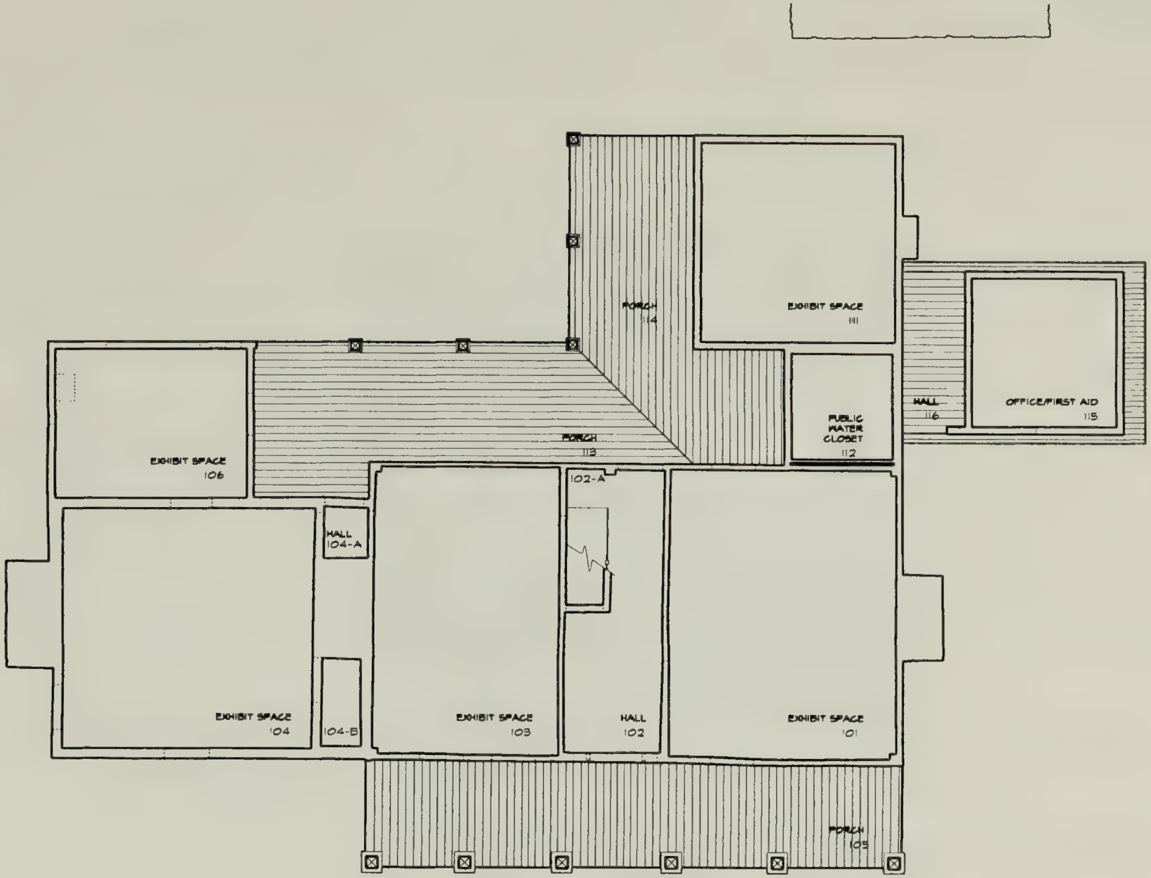


EXHIBIT SPACE
111
PORCH
114
OFFICE/FIRST AID
115
HALL
116
PUBLIC
WATER
CLOSET
112
EXHIBIT SPACE
106
PORCH
113
102-A
HALL
104-A
EXHIBIT SPACE
104
104-B
EXHIBIT SPACE
103
HALL
102
EXHIBIT SPACE
101
PORCH
105

FIRST FLOOR REFLECTED CEILING PLAN

SCALE 1/4' = 1-0

0 1 2 4 8

DESIGNED	SHEET TITLE	AUTOCAD FILE	DRAWING NO
		MHDDRC01	357/80007
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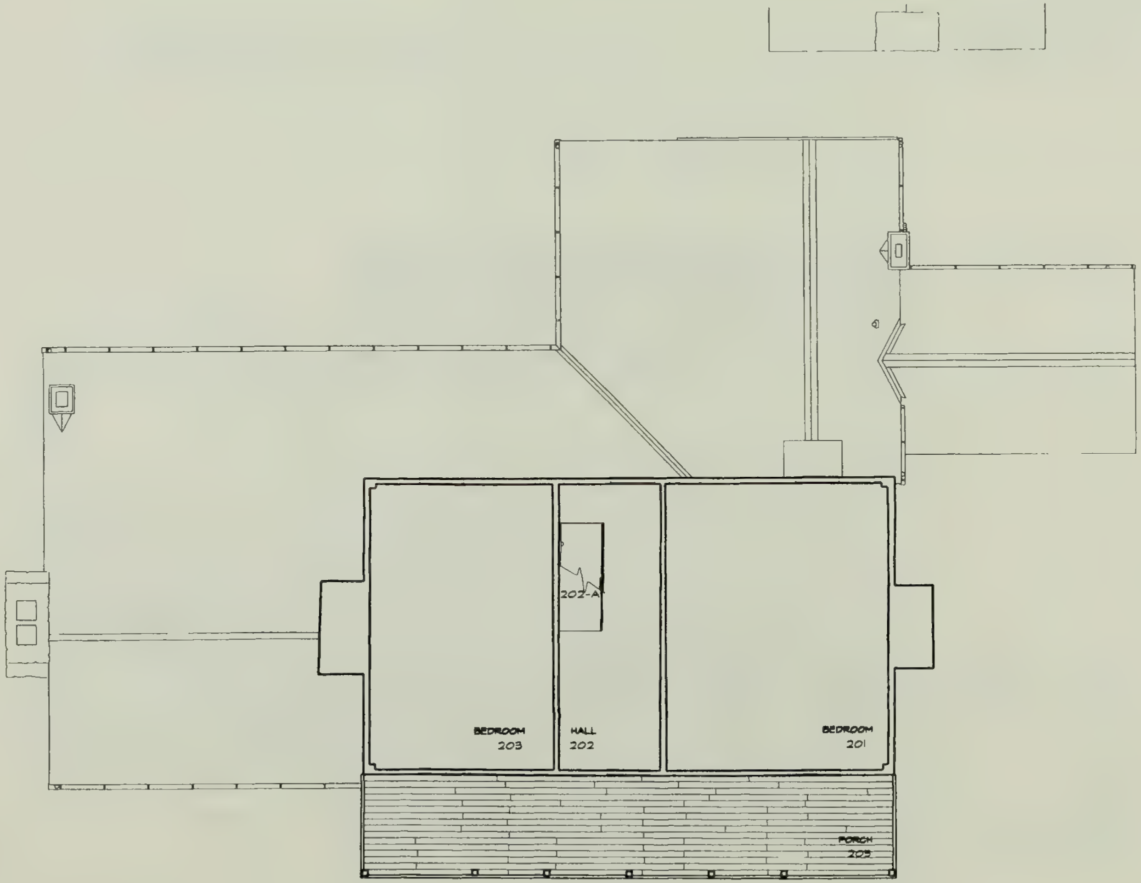
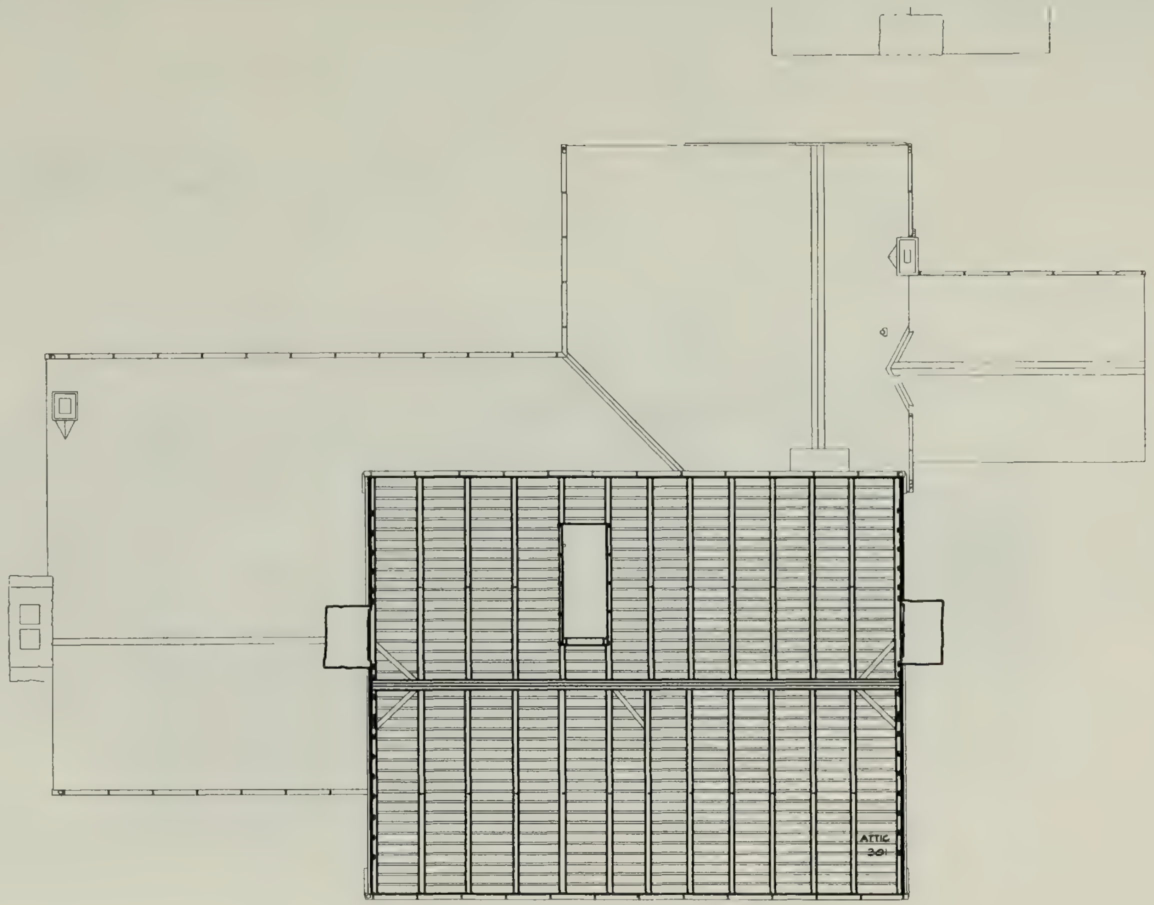
DATE JUNE 30 1994			OF 29


202-A
BEDROOM
203
HALL
202
BEDROOM
201
PORCH
205

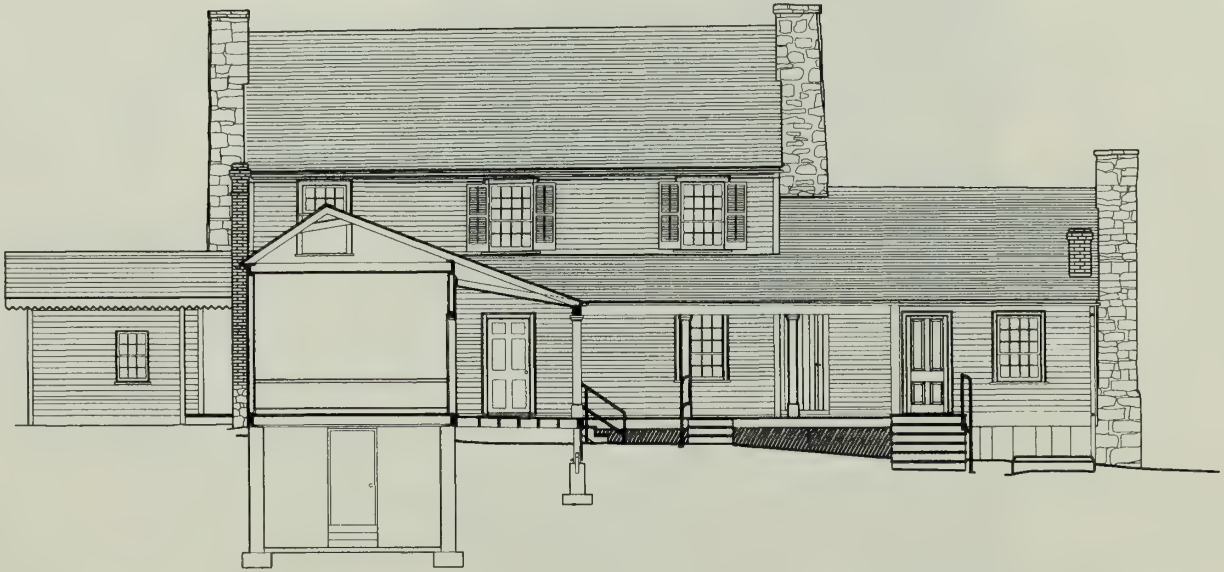
SECOND FLOOR REFLECTED CEILING PLAN
SCALE 1/4 = 1'-0
0 1 2 4 8

DESIGNED	SHEET TITLE	AUTOCAD FILE HHDDRC02	DRAWING NO 357/80007
DRAWN L M JOHNSON TECH REV A R O'BRIGHT DATE JUNE 30 1994	DESIGN DEVELOPMENT REFLECTED CEILING PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	SUB SHEET	SHEET 10 OF 29



ATTIC REFLECTED CEILING PLAN
SCALE 1/4 = 1-0"

DESIGNED	SHEET TITLE	AUTOCAD FILE MHDDRC03	DRAWING NO 337/80007
DRAWN L M JOHNSON TECH REV A M OBRIGHT DATE JUNE 30 1994	DESIGN DEVELOPMENT REFLECTED CEILING PLAN MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	SUB SHEET	SHEET 11 OF 29

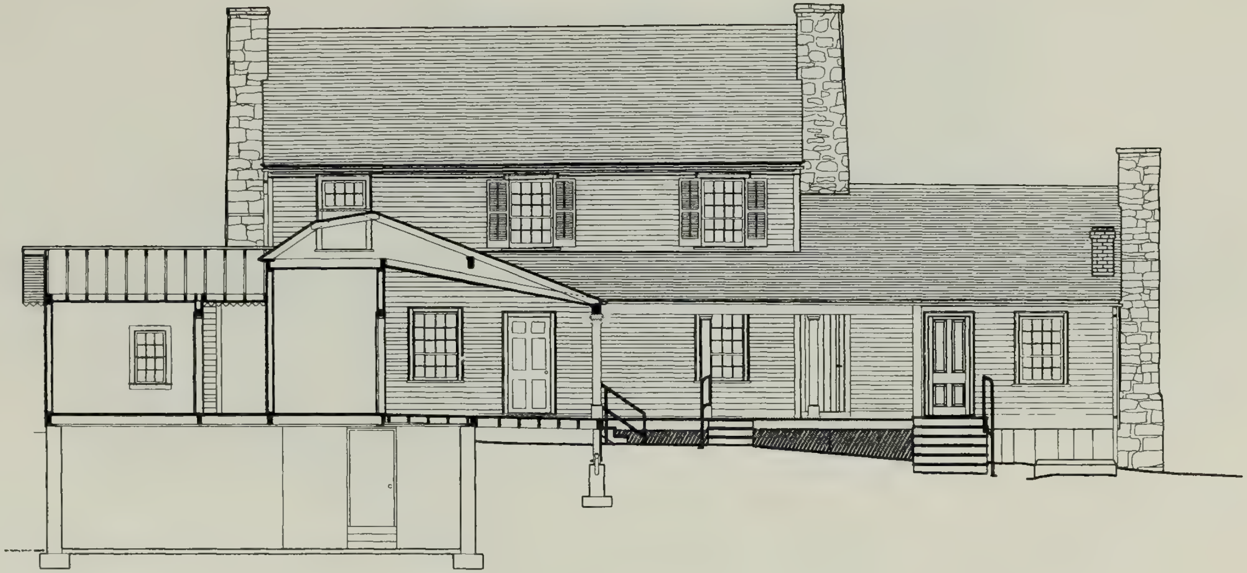


SECTION THRU HUNT ADDITION

SCALE 1/4" = 1'-0"

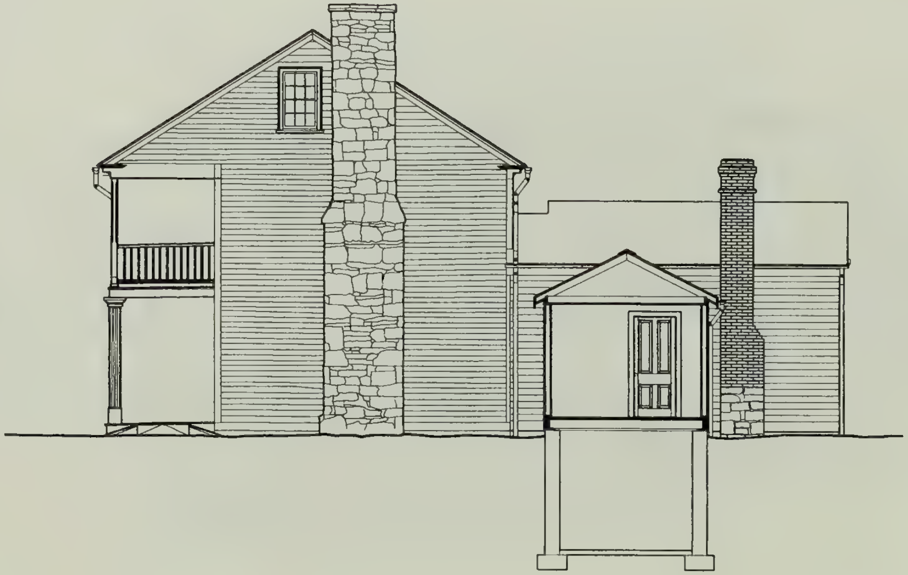
0 1 2 4 8

DESIGNED	SHEET TITLE	AUTOCAD FILE MHCNDT2B	DRAWING NO 351/80007
DRAWN L M JOHNSON TECH REV A M OBRIGHT	DESIGN DEVELOPMENT SECTION THRU HUNT ADDITION MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	SUB SHEET	SHEET 12
DATE JUNE 30 1994			OF 29



SECTION THRU HUNT ADDITION
SCALE 1/4" = 1'-0"
0 1 2 4 8

DESIGNED	SHEET TITLE	AUTOCAD FILE MHCND738	DRAWING NO 357/80007
DRAWN L M JOHNSON TECH REV A R OBRIGHT DATE JUNE 30 1994	DESIGN DEVELOPMENT SECTION THRU HUNT ADDITION MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	SUB SHEET	SHEET 13 OF 29

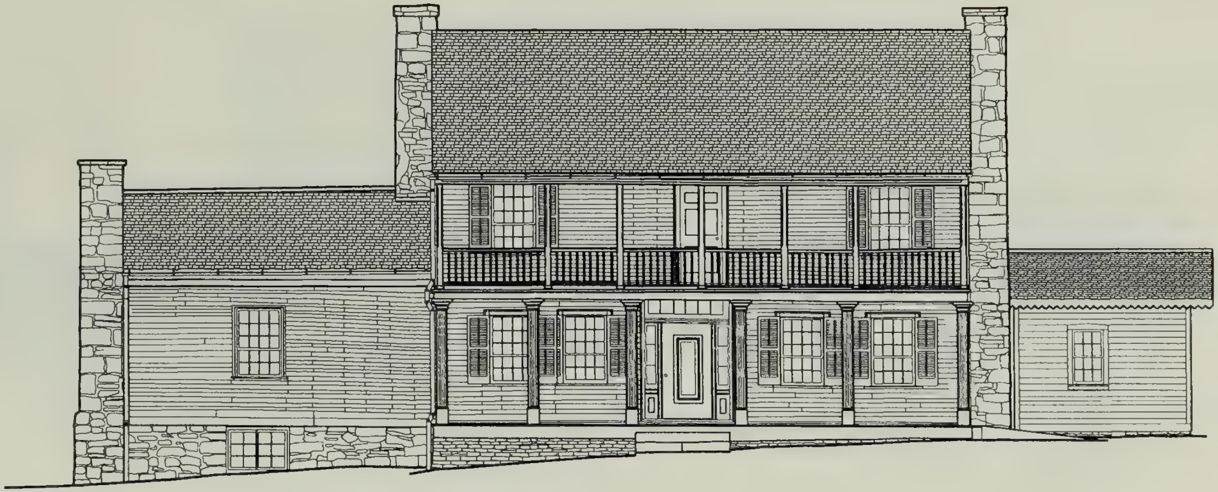


SECTION THRU EAST ADDITION

SCALE 1/4" = 1'-0"

0 1 2 4 8

DESIGNED	SHEET TITLE DESIGN DEVELOPMENT SECTION THRU EAST ADDITION MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	AUTOCAD FILE MHCNDT4B	DRAWING NO 357/80007
DRAWN L H JOHNSON TECH REV A R O'BRIGHT DATE JUNE 30 1994		SUB SHEET	SHEET 14 OF 29

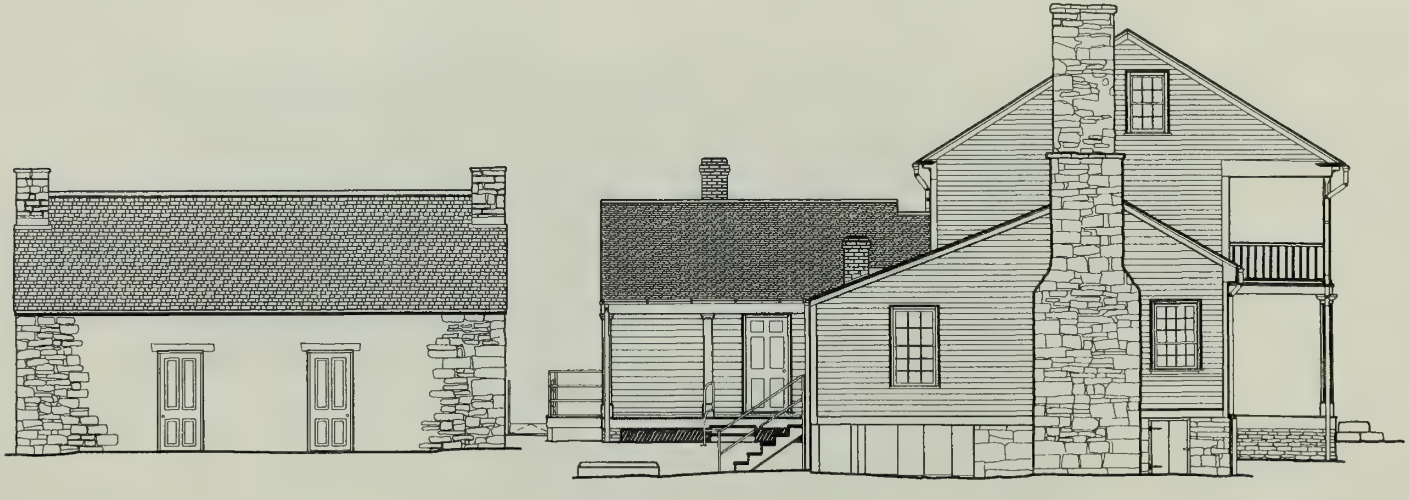


SOUTH ELEVATION

SCALE: 1/4" = 1'-0"

0 1 2 4 8

DESIGNED	SHEET TITLE DESIGN DEVELOPMENT SOUTH EXTERIOR ELEVATION MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	AUTOCAD FILE: MHODEE 5	DRAWING NO 357/00007
DRAWN L M JOHNSON TECH REV A R O'BRIGHT		SUB SHEET	SHEET 15
DATE JUNE 30 1994			OF 29

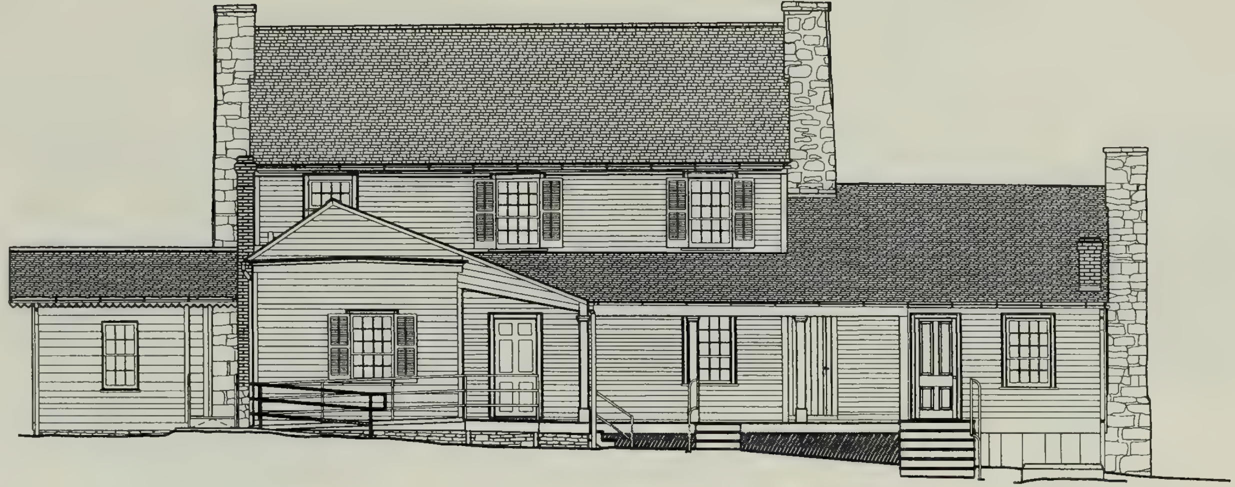


WEST ELEVATION

SCALE: 1/4" = 1'-0"

0 1 2 4 8

DESIGNED	SHEET TITLE DESIGN DEVELOPMENT WEST EXTERIOR ELEVATION MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	AUTOCAD FILE: HHODEEIN	DRAWING NO 337/80007
DRAWN L M JOHNSON TECH REV A R OBRIGHT		SUB SHEET	SHEET 16
DATE JUNE 30 1994			OF 29

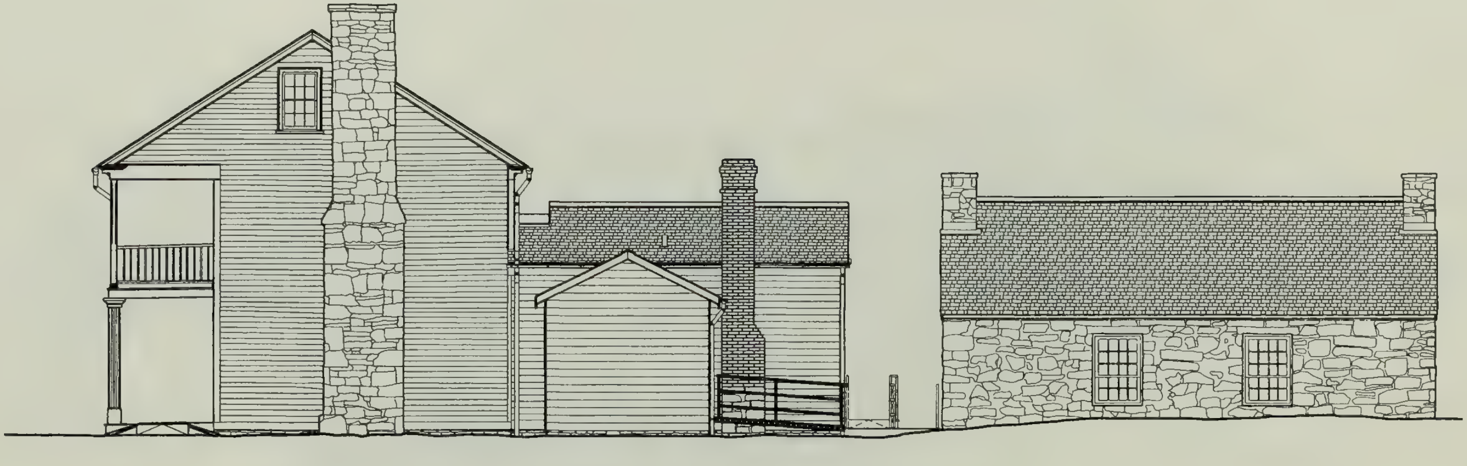


NORTH ELEVATION

SCALE: 1/4" = 1'-0"

0 1 2 4 8

DESIGNED	SHEET TITLE DESIGN DEVELOPMENT NORTH EXTERIOR ELEVATION MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	AUTOCAD FILE MHODEEIN	DRAWING NO 357/80007
DRAWN L M JOHNSON TECH REV A K OBRIGHT		SUB SHEET	SHEET 17
DATE JUNE 30 1994			OF 29

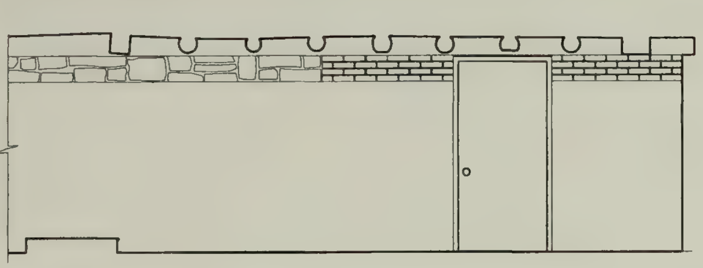


EAST ELEVATION

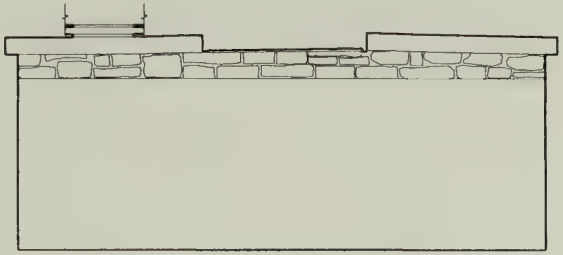
SCALE: 1/4" = 1'-0"

0 1 2 4 8

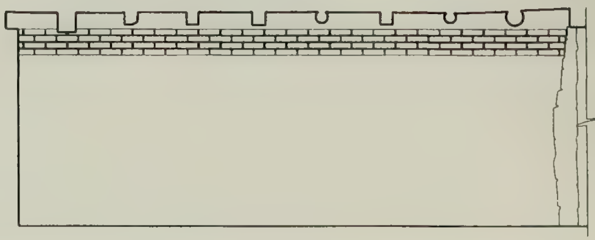
DESIGNED	SHEET TITLE	AUTOCAD FILE MHDDEEIE	DRAWING NO 357/80007
DRAWN: L M JOHNSON TECH REV A R O'BRIGHT	DESIGN DEVELOPMENT EAST EXTERIOR ELEVATION MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	SUB SHEET	SHEET 18 OF 29
DATE JUNE 30 1994			



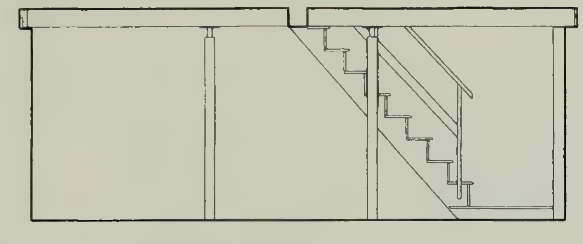
NORTH
BASEMENT 001



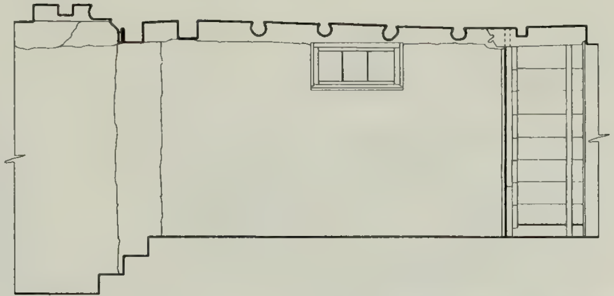
EAST



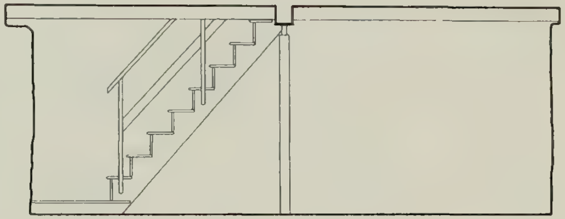
SOUTH



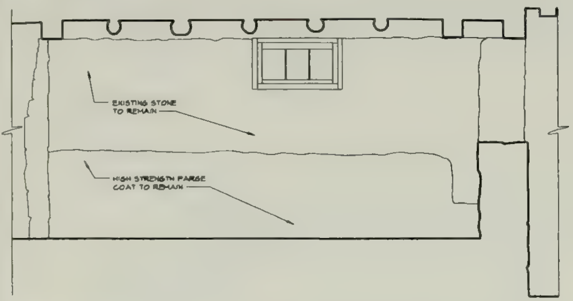
WEST
BASEMENT 001



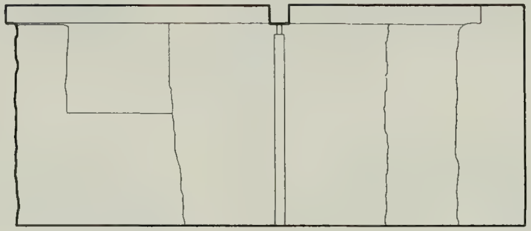
NORTH
BASEMENT 002



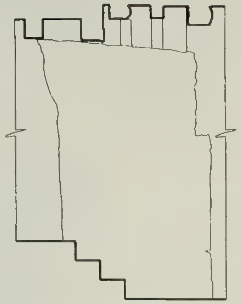
EAST


EXISTING STONE TO REMAIN
HIGH STRENGTH PARGE COAT TO REMAIN

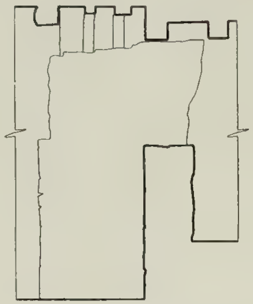
SOUTH
BASEMENT 002



WEST



SOUTH ELEVATION
BASEMENT 002C



NORTH ELEVATION
BASEMENT 003

SCALE 1/2" = 1'-0"
0 6" 1 2 3

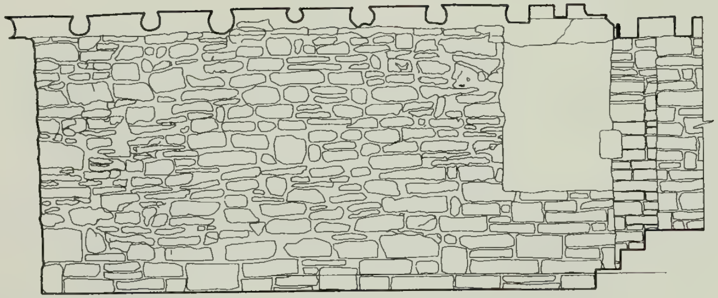
DESIGNED

DRAWN
L M JOHNSON
TECH REV
A R OBRIGHT
DATE
JUNE 30 1994

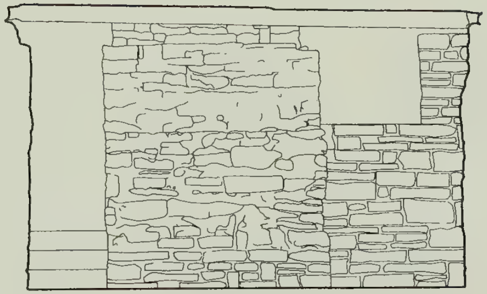
SHEET TITLE
DESIGN DEVELOPMENT
INTERIOR ELEVATIONS
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NHS
ST. LOUIS, MO

AUTOCAD FILE
MHOD E01
SUB SHEET

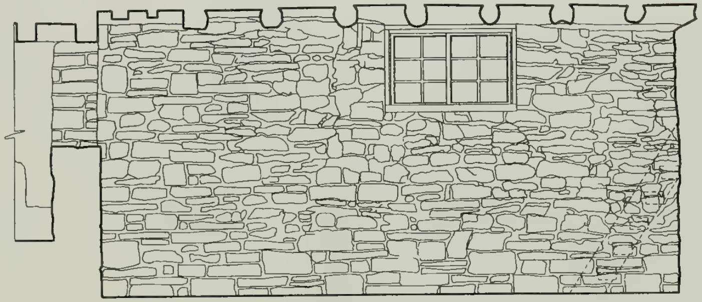
DRAWING NO
357/80007
SHEET 19
OF 29



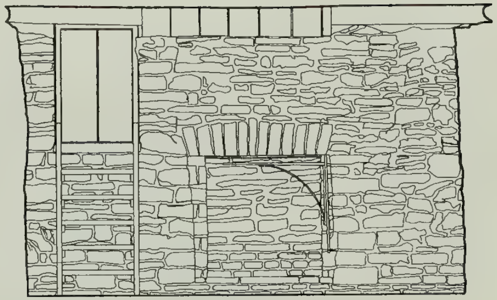
NORTH
WINTER KITCHEN 003



EAST



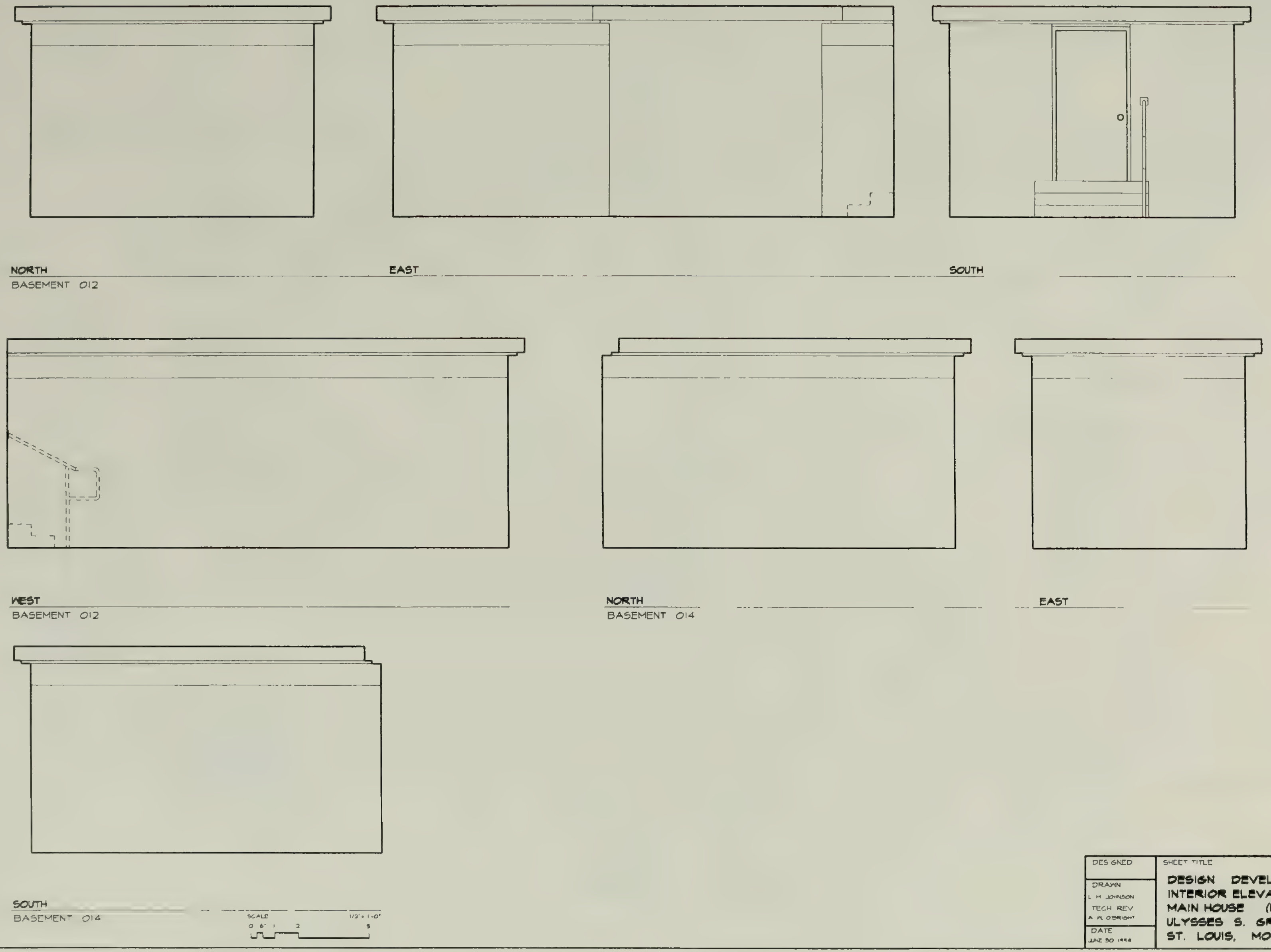
SOUTH
WINTER KITCHEN 003



WEST

SCALE 1/2" = 1'-0"
0 6" 1' 2 5

DESIGNED	SHEET TITLE	AUTOCAD FILE: MHDDIE02	DRAWING NO 337/80007
DRAWN L M JOHNSON TECH REV. A. M. O'BRIGHT DATE JUNE 30 1994	DESIGN DEVELOPMENT INTERIOR ELEVATIONS MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	SUB SHEET	SHEET 20 OF 29


NORTH
BASEMENT 012
EAST
SOUTH
WEST
BASEMENT 012
NORTH
BASEMENT 014
EAST
SOUTH
BASEMENT 014
SCALE
0 6" 1 2 5
1/2" = 1'-0"

DESIGNED

DRAWN
L M JOHNSON
TECH REV
A R O'BRIGHT

DATE
JUNE 30 1994

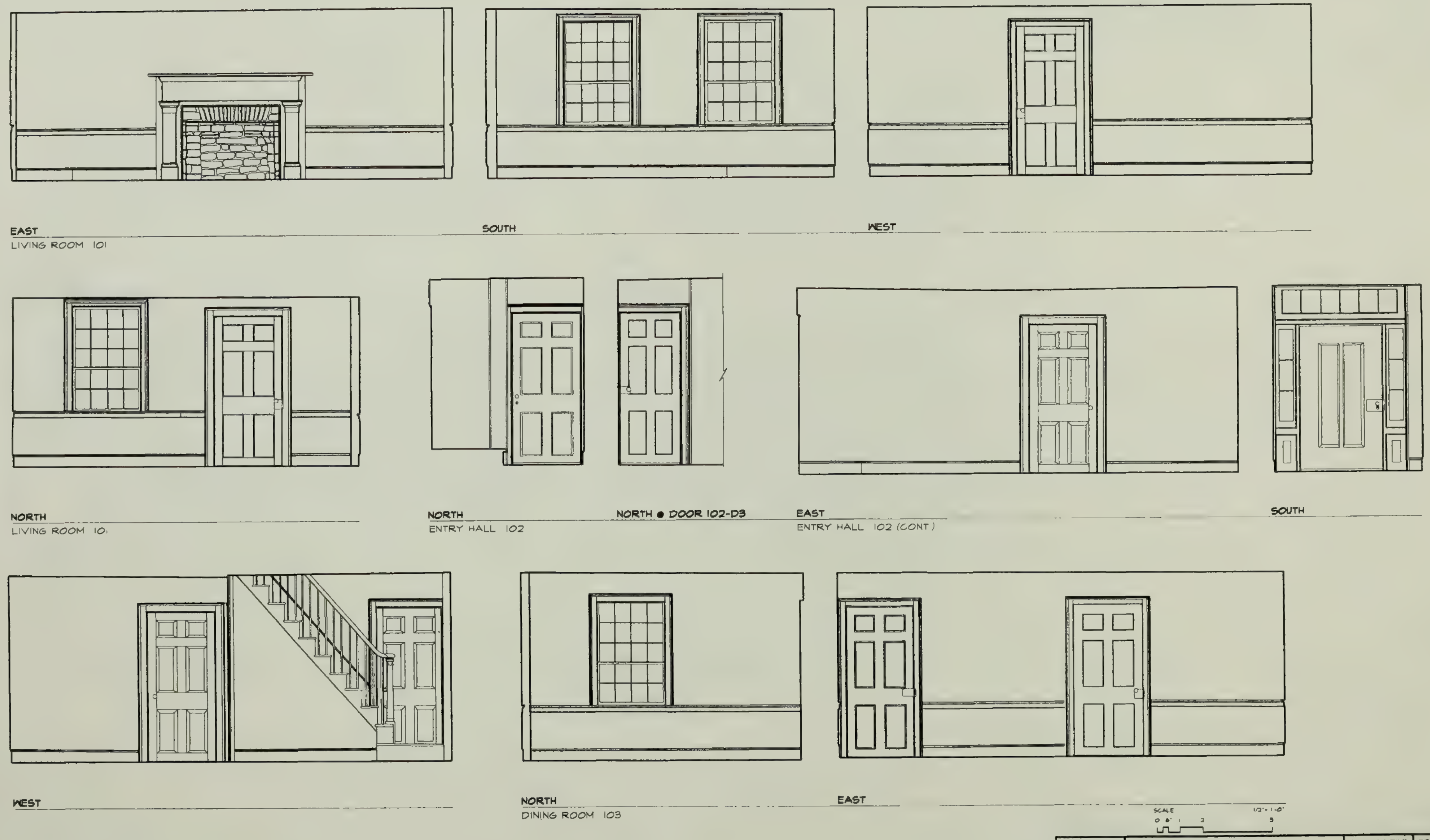
SHEET TITLE
DESIGN DEVELOPMENT
INTERIOR ELEVATIONS
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NHS
ST. LOUIS, MO

AUTOCAD FILE
MHDD:E03

SUB SHEET

DRAWING NO
337/80007

SHEET 21
OF 29


EAST
LIVING ROOM 101
SOUTH
WEST
NORTH
LIVING ROOM 101
NORTH
ENTRY HALL 102
NORTH ● DOOR 102-D3
EAST
ENTRY HALL 102 (CONT)
SOUTH
WEST
NORTH
DINING ROOM 103
EAST
SCALE
0 6" 1 2 5
1/2" = 1'-0"

DESIGNED

DRAWN
L M JOHNSON

TECH REV
A M O'BRIGHT

DATE
JUNE 30 1994

SHEET TITLE

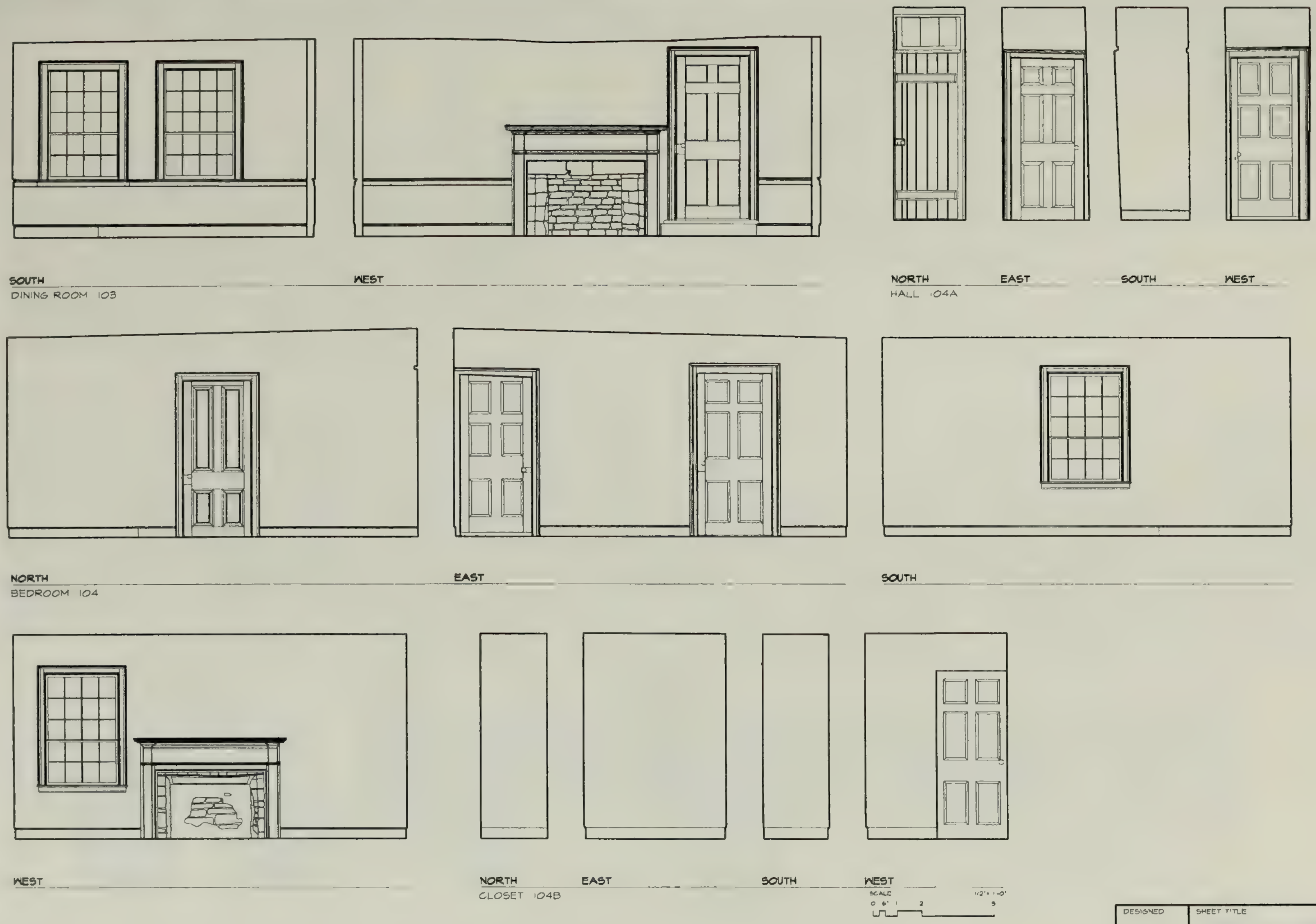
DESIGN DEVELOPMENT
INTERIOR ELEVATIONS
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NHS
ST. LOUIS, MO

AUTOCAD FILE.
HMDDIE04

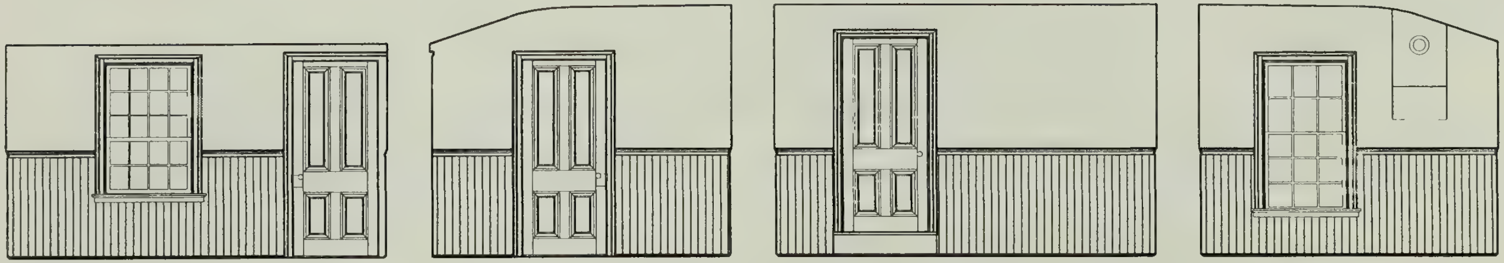
SUB SHEET

DRAWING NO
337/80007

SHEET **22**
OF **29**

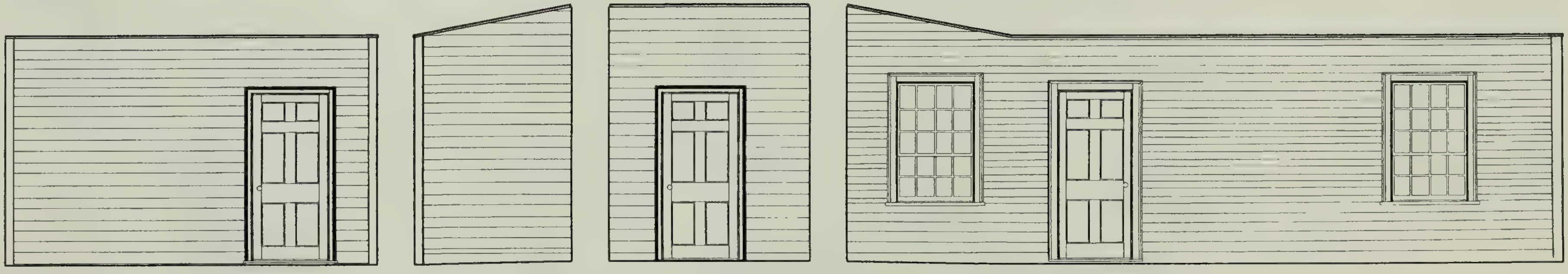

SOUTH
DINING ROOM 103
WEST
NORTH
HALL 104A
EAST
SOUTH
WEST
NORTH
BEDROOM 104
EAST
SOUTH
WEST
NORTH
CLOSET 104B
EAST
SOUTH
WEST
SCALE
1/2" = 1'-0"
0
6"
1
2
5

DESIGNED	SHEET TITLE	AUTOCAD FILE MHDD 205	DRAWING NO 357/80007
DRAWN L M JOHNSON TECH REV A R OBRIGHT DATE JUNE 30 1994	DESIGN DEVELOPMENT INTERIOR ELEVATIONS MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	SUB SHEET	SHEET 23 OF 29



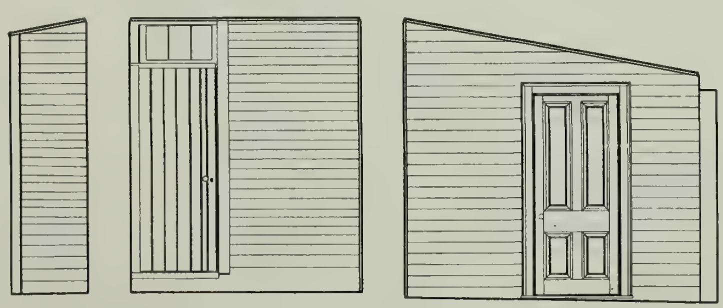
NORTH EAST SOUTH WEST

KITCHEN 106



EAST NORTH EAST SOUTH

BACK PORCH 113 & 114

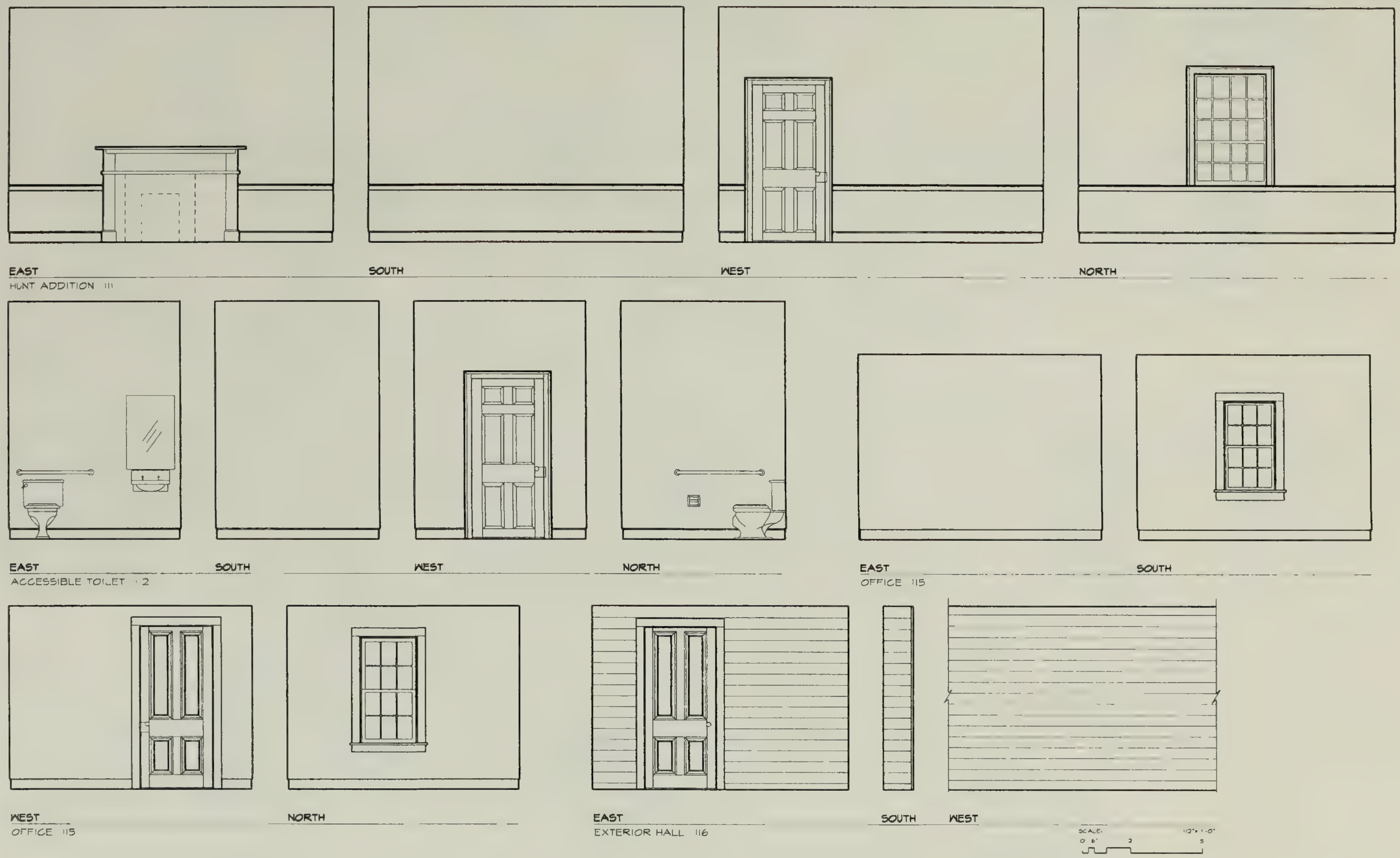


EAST SOUTH WEST

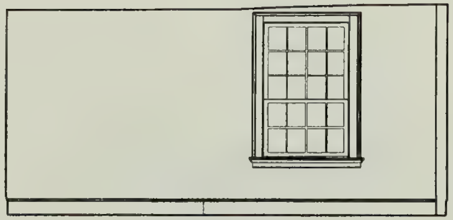
BACK PORCH 113 & 114

SCALE: 1/2" = 1'-0"

DESIGNED	SHEET TITLE	AUTOCAD FILE HHDDIE06	DRAWING NO 357/80007
DRAWN L M JOHNSON TECH REV A R O'BRIGHT	DESIGN DEVELOPMENT INTERIOR ELEVATIONS MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	SUB SHEET	SHEET 24 OF 29
DATE JUNE 30 1994			

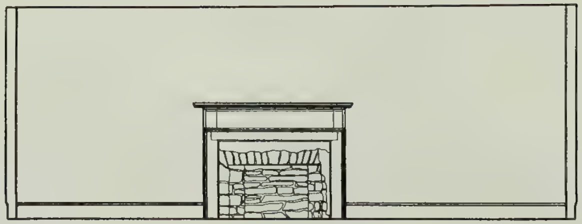

EAST
HUNT ADDITION 111
SOUTH
WEST
NORTH
EAST
ACCESSIBLE TOILET 112
SOUTH
WEST
NORTH
EAST
OFFICE 115
SOUTH
WEST
OFFICE 115
NORTH
EAST
EXTERIOR HALL 116
SOUTH
WEST
SCALE:
1/2" = 1'-0"
0 6" 2 5

DESIGNED	SHEET TITLE	AUTOCAD FILE MHDD.E07	DRAWING NO 357/80007
DRAWN L. M. JOHNSON TECH REV A. K. OBRIGHT	**DESIGN DEVELOPMENT** **INTERIOR ELEVATIONS** **MAIN HOUSE (HS-1)** **ULYSSES S. GRANT NHS** **ST. LOUIS, MO**	SUB SHEET	SHEET **25** OF **29**
DATE JUNE 30 1994			

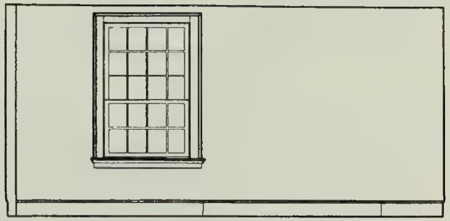


NORTH

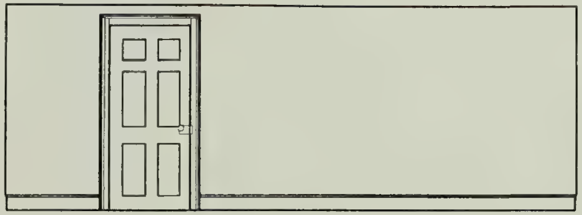
BEDROOM 201



EAST

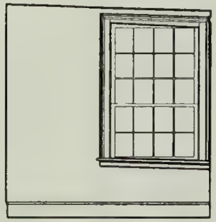


SOUTH



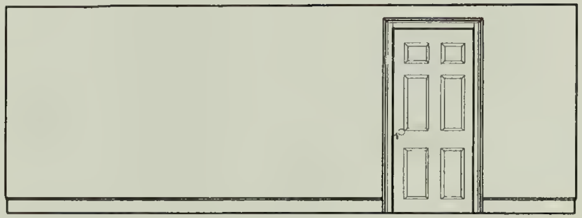
WEST

BEDROOM 201

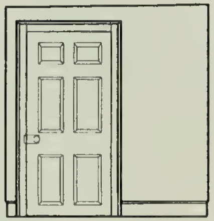


NORTH

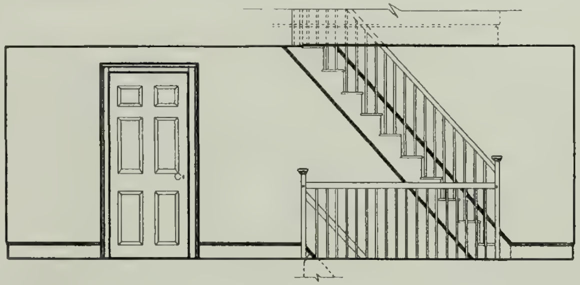
STAIRHALL 202



EAST

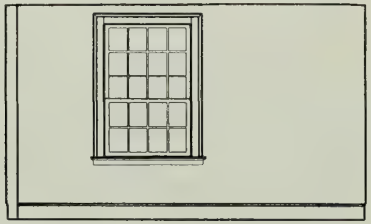


SOUTH



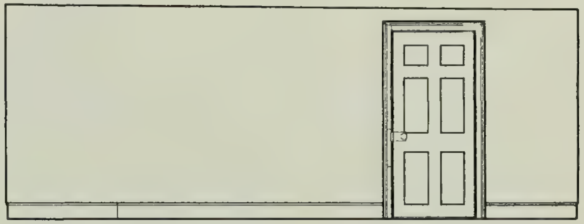
WEST

STAIRHALL 202



NORTH

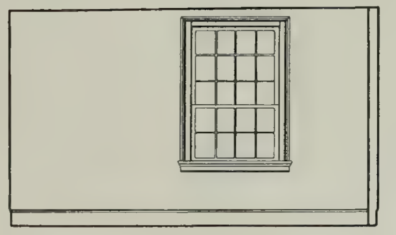
BEDROOM 203



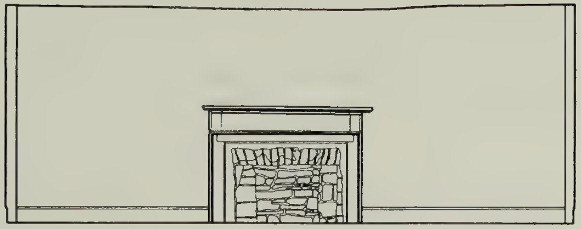
EAST

SCALE 1/2" = 1'-0"
0 6" 1 2 5

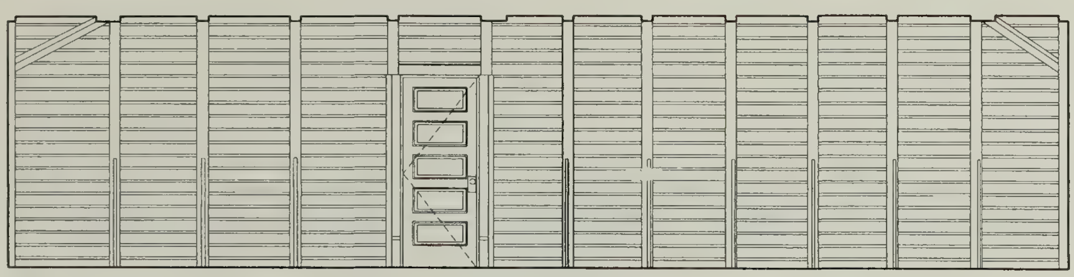
DESIGNED	SHEET TITLE DESIGN DEVELOPMENT INTERIOR ELEVATIONS MAIN HOUSE (HS-1) ULYSSES S. GRANT NHS ST. LOUIS, MO	AUTOCAD FILE MHDD1208	DRAWING NO 357/80007
DRAWN L M JOHNSON TECH REV A M OBRIGHT		SUB SHEET	SHEET 26
DATE JUNE 30 1994			OF 29



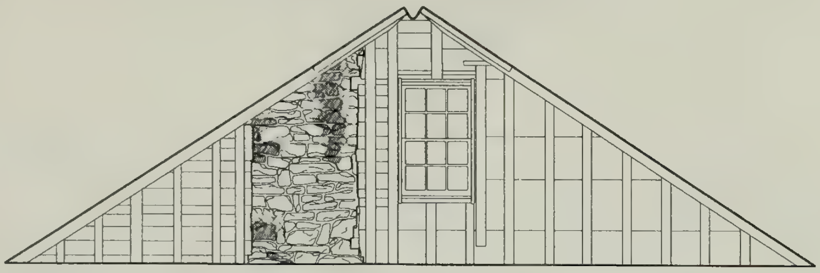
NORTH
BEDROOM 203



WEST



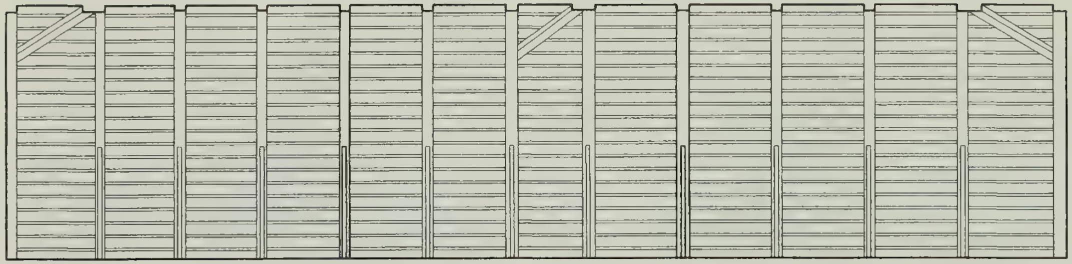
NORTH
ATTIC 301



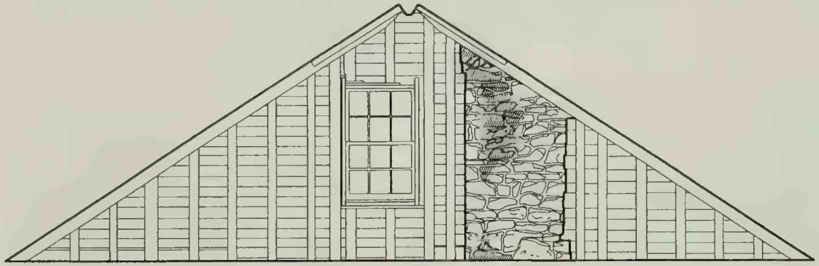
EAST
ATTIC 301

SCALE 1/2" = 1'-0"
0 6" 1 2' 5

DESIGNED	SHEET TITLE **DESIGN DEVELOPMENT** **INTERIOR ELEVATIONS** **MAIN HOUSE (HS-1)** **ULYSSES S. GRANT NHS** **ST. LOUIS, MO**	AUTOCAD FILE MHDDIE04	DRAWING NO 397/80007
DRAWN M JOHNSON TECH REV A R OBRIGHT		SUB SHEET	SHEET **27**
DATE JUNE 30 1994			OF **29**



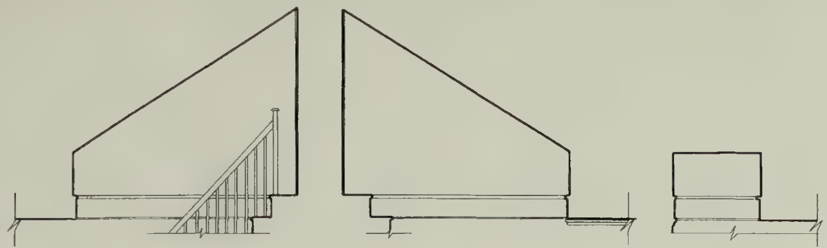
SOUTH
ATTIC 301



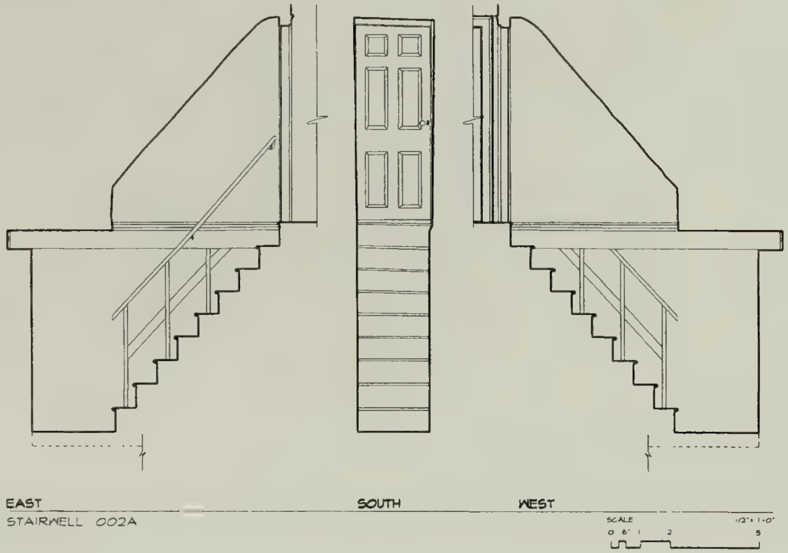
WEST
ATTIC 301

SCALE 1/2" = 1'-0"
0 6" 1 2 3

DESIGNED	SHEET TITLE	AUTOCAD FILE MHDDIEIO	DRAWING NO 357/80007
DRAWN L M JOHNSON TECH REV A R O'BRIGHT DATE JUNE 30 1994	**DESIGN DEVELOPMENT** **INTERIOR ELEVATIONS** **MAIN HOUSE (HS-1)** **ULYSSES S. GRANT NHS** **ST. LOUIS, MO**	SUB SHEET	SHEET **28** OF **29**


EAST
WEST
NORTH

STAIRWELL 202A


EAST
SOUTH
WEST
SCALE
1/2" = 1'-0"
0
6"
1
2
5

STAIRWELL 002A

DESIGNED

DRAWN
L M JOHNSON
TECH REV
A R OBRIGHT

DATE
JUNE 30 1994

SHEET TITLE
DESIGN DEVELOPMENT
INTERIOR ELEVATIONS
MAIN HOUSE (HS-1)
ULYSSES S. GRANT NHS
ST. LOUIS, MO

AUTOCAD FILE
MHDD-C1

SUB SHEET

DRAWING NO
357/80007

SHEET 29
OF 29

DIVISION III - STONE BUILDING (HS-2)

INTRODUCTION

The structure presently designated as the Stone Building has served a variety of uses over its lifetime in response to changes in site ownership and function. Although now tied to the house via a breezeway, the Stone Building remained physically separated from the Main House until the 1950s. However, the structure was an important component in the function of the Main House for several decades. Unfortunately, circumstantial evidence may be all the information that can used to document its early function as a large portion of the structure collapsed and was removed around 1900. Its subsequent adaptive use as a garage may have resulted in disturbance of significant archeological evidence. Nineteenth century documentary evidence for the building is limited to a circa 1860 photograph of the lower portion of the west elevation and early engravings, with images expressing much "artistic license." By the time clear photographs were taken in the early twentieth century, a large portion of the Stone Building was in a state of ruin.

While the Stone Building may not have been of functional significance during Grant's period of ownership, it is still important to at least understand its origins and relationship with the house and site. With the bits and pieces of documentary, physical, and archeological evidence currently available, an accurate account of the life of this building has been developed.

PART 1: DEVELOPMENTAL HISTORY

HISTORIC PHOTOGRAPHS AND ILLUSTRATIONS

The extent of truly useful graphic documentation on the Stone Building from the nineteenth century, particularly photographs, is quite limited. Most of the sketches and lithographs produced for newspapers and magazines at that time had little detail, and the detail that was included has usually found to have been fabricated or incorrectly positioned. At least these illustrations give an indication that the Stone Building was in existence as early as 1840. The only nineteenth century photographic image of the structure appears in the background of a circa 1860 view of the Main House and grounds. Although the image is unclear, there are enough shadow lines and contrast to detect the presence of openings and stone work.

By the early twentieth century, photographs had been taken of the structure. But by then the west wall and the roof had collapsed and been replaced with concealing features of interest. Perhaps the most revealing photographs from an investigative standpoint were taken in 1947 when an aspiring young architect recorded the structure without the replacement roof and west wall. By then, the Stone Building was virtually in ruins.

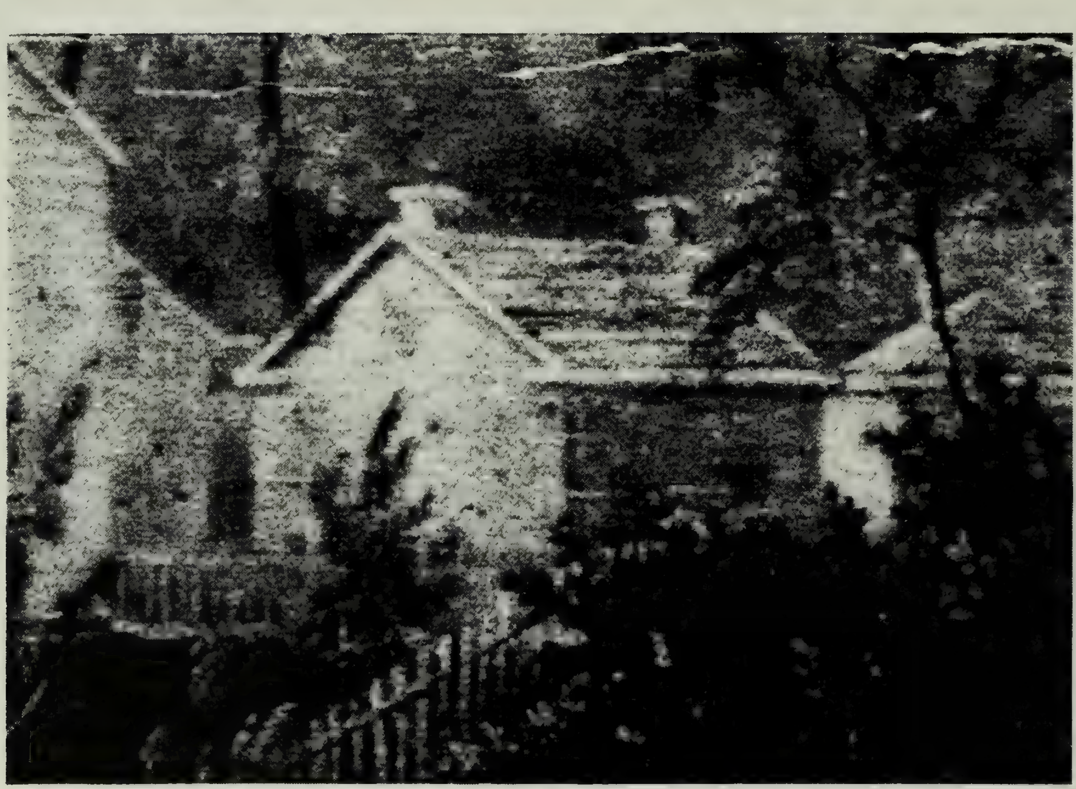


Figure 3.1 - "White Haven, the House in Which and Where I was Born--August 29, 1816." The earliest known illustration of the Stone Building. Two gable-end chimneys and eave returns on the south elevation are clearly depicted. Faint images of two windows are seen at the east elevation. See Figure 2.1 for complete view of the illustration. (Circa 1880 albumen print of circa 1840 painting reprinted by permission of the Missouri Historical Society).

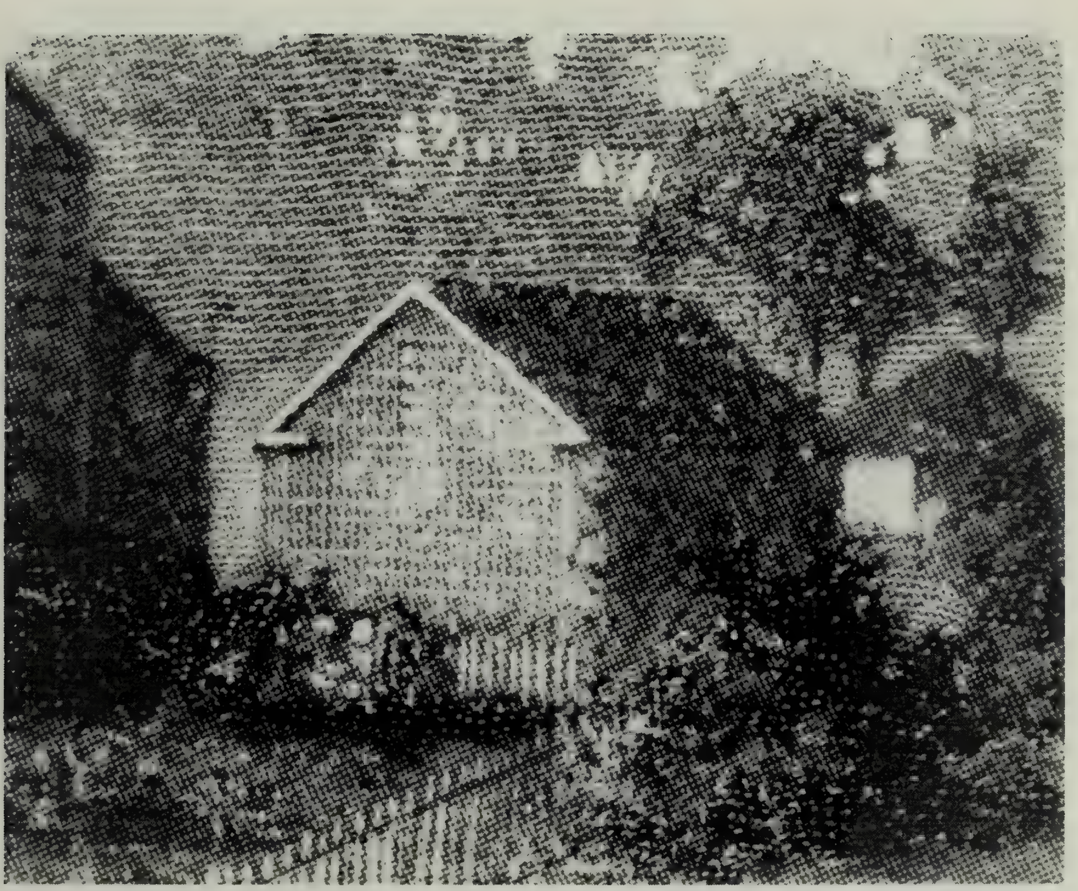


Figure 3.2 - "'Whitehaven' the Dent Homestead near St. Louis, Missouri. Redrawn from an Old Drawing Owned by Mrs. Grant." This illustration was copied from an earlier illustration seen in Figure 3.1, but the gable end chimneys and east elevation windows are not shown. See Figure 2.1 for a complete view of this enlarged detail. (Undated print reprinted by permission of Missouri Historical Society).

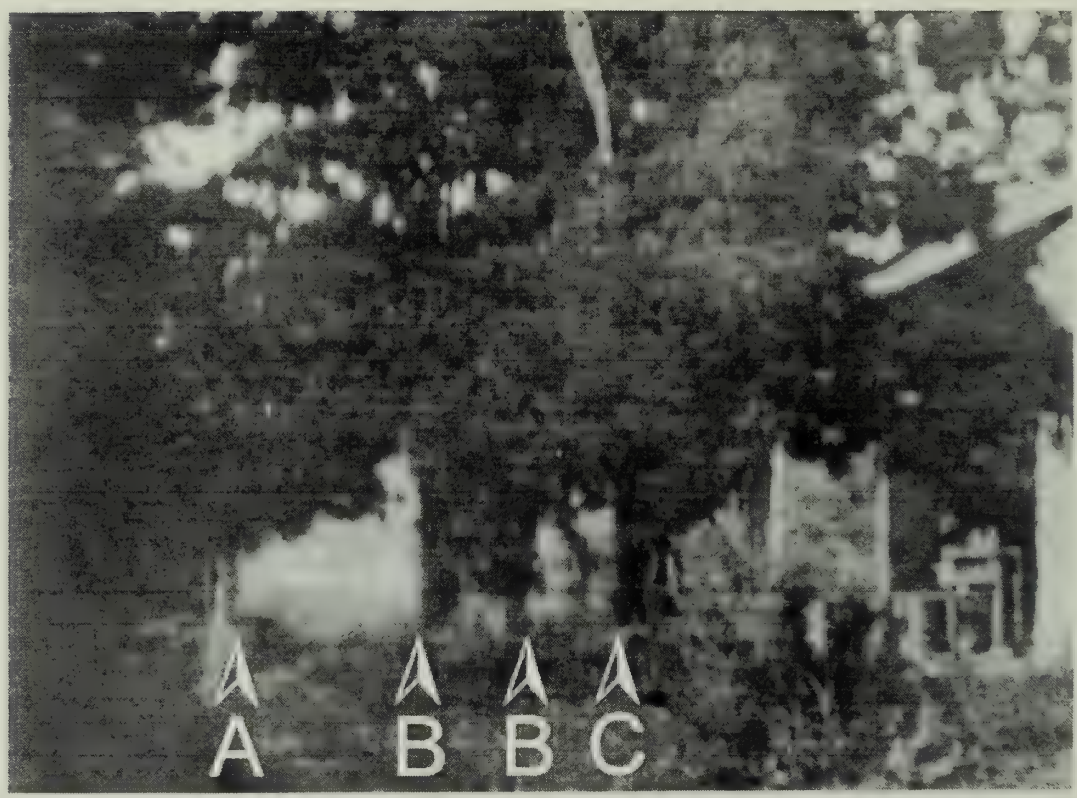


Figure 3.3 - Enlarged detail of 1860 photograph reproduced in Figure 2.1. The lower half of the Stone Building can be seen beneath the tree in the center of the photograph, and extending beneath the Main House porch roof. High resolution scanning of the original photograph enabled the location of some features of the Stone Building. The northwest corner of the structure is seen at (**A**). Edges of the doorway leading into the north room are seen at (**B**), and the north jamb of the door leading into the south room can be seen at (**C**). No other features can be seen due to concealment by trees and the Main House, but stone texture can be seen across the face of the Stone Building. (Circa 1870 albumen print of circa 1860 photographic plate or print, ULSG collections).

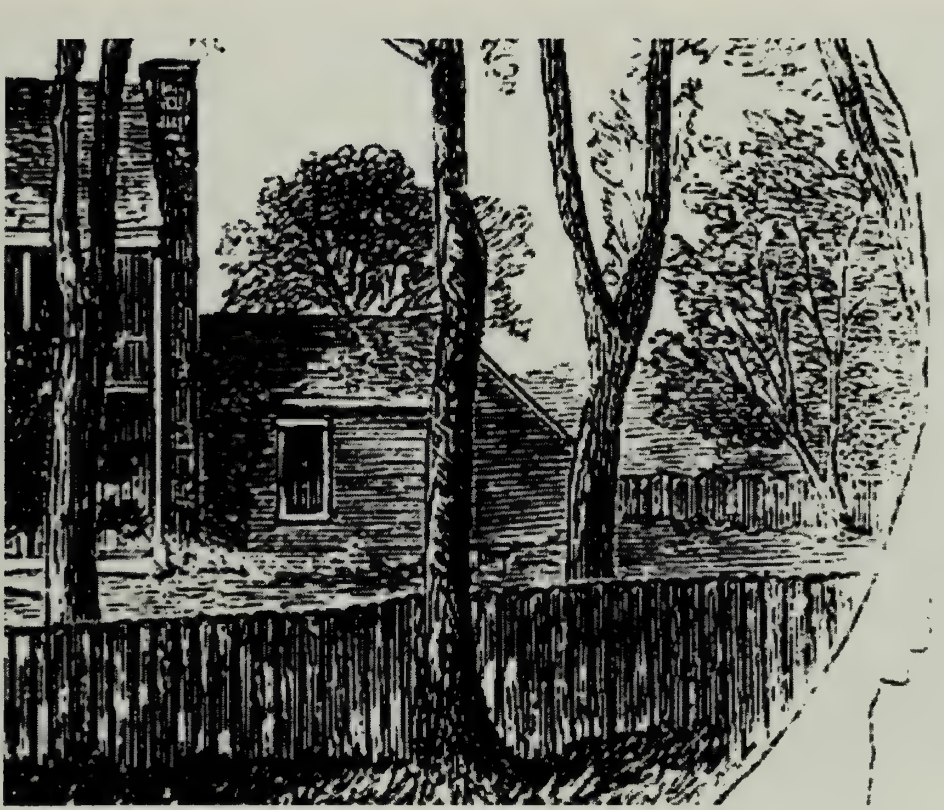


Figure 3.4 - "Whitehaven-Dent Farm-Mrs. Grant's Birthplace." It is assumed that the Stone Building is represented in this illustration by the structure just to the right of the Main House East Wing between the two trees. However, the true location of the Stone Building would have been concealed behind the East Wing. (Enlarged detail of illustration, Albert D. Richardson, *A Personal History of U.S. Grant*, (Hartford, Connecticut: American Publishing Company, 1869), 150-151, ULSG collections).

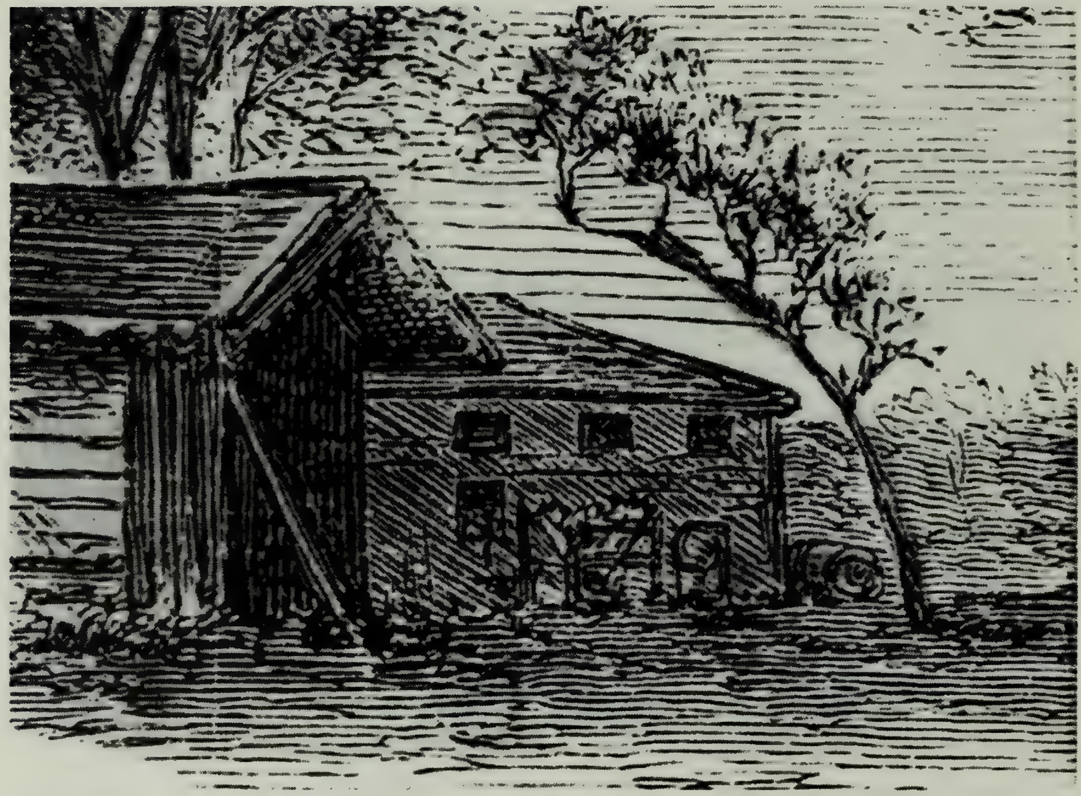


Figure 3.5 - A view of the east elevation of the Stone Building from the southeast. This illustration shows three small windows beneath the eave line in the elevation. There is no physical evidence that these windows ever existed. See Figure 2.5 for an entire view of this illustration. (Enlarged detail taken from unbound colored engraving from *Every Saturday*, circa 1872, Jesse Francis collection).

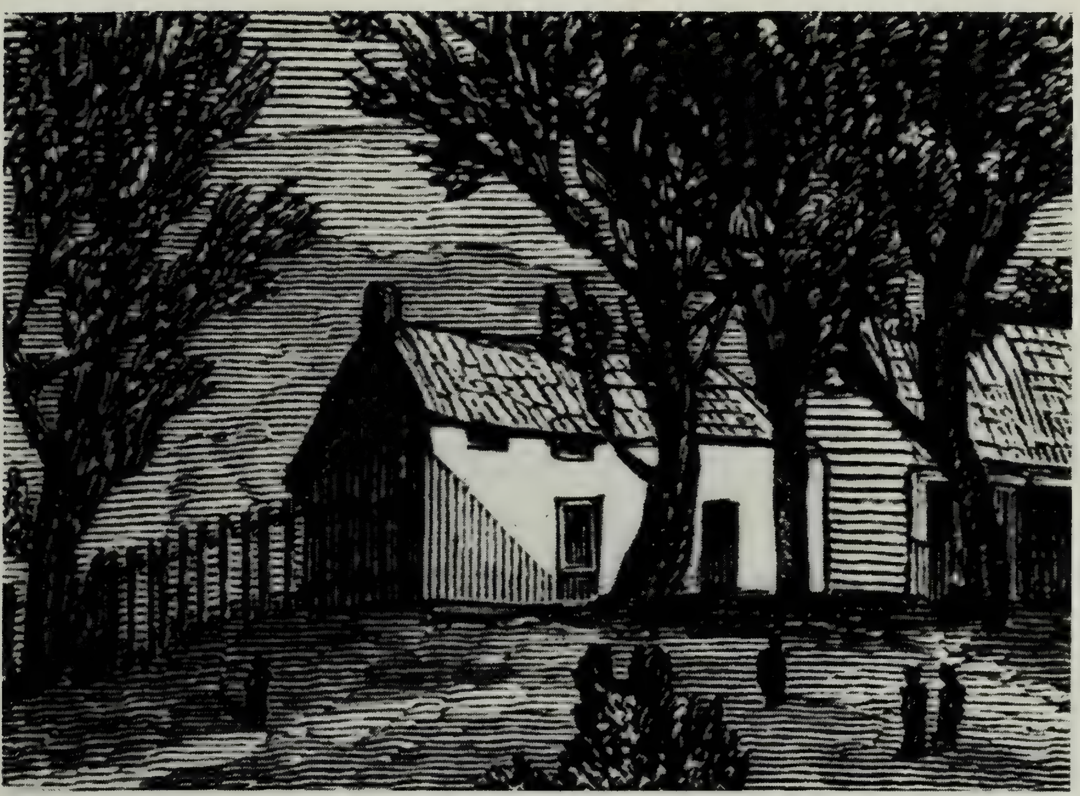


Figure 3.6 - "Missouri-President Grant's Farm Near St. Louis." Enlarged detail of the Stone Building viewed from the northwest. The positioning of the two doorways is confirmed by the circa 1860 photograph seen in Figure 3.3. The images of the two small windows placed beneath the eave line compares with the three openings seen in an illustration depicting the east elvation at Figure 3.5. Existance of the upper windows cannot be confirmed as the west wall collapsed prior to 1913, and no clear photographs have yet been found showing the upper half of the west elevation as it appeared prior to the wall's collapse. (Engraving from sketch by William Staengel, *Frank Leslie's Illustrated Newspaper*, (October 16, 1875), 93, ULSG collections).

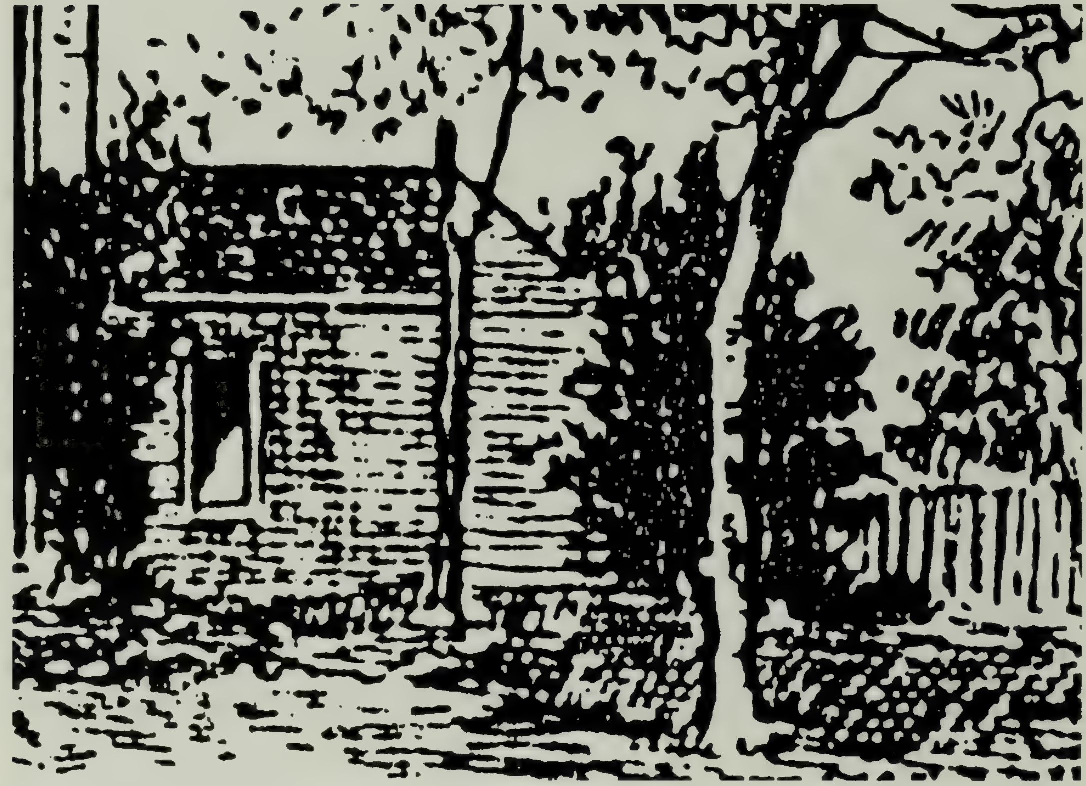


Figure 3.7 - "Residence of Captain and Mrs. Grant in and about St. Louis: Mrs. Grant's Birthplace." It is believed that the Stone Building is represented by the the shed roof between the two trees. Not unlike Figure 3.4, the accuracy of the placement of the Stone Building in this illustration is also flawed. (Enlarged detail of illustration from Herman Dieck, *Life and Public Service of General Ulysses S. Grant*, 1885, Missouri Historical Society).

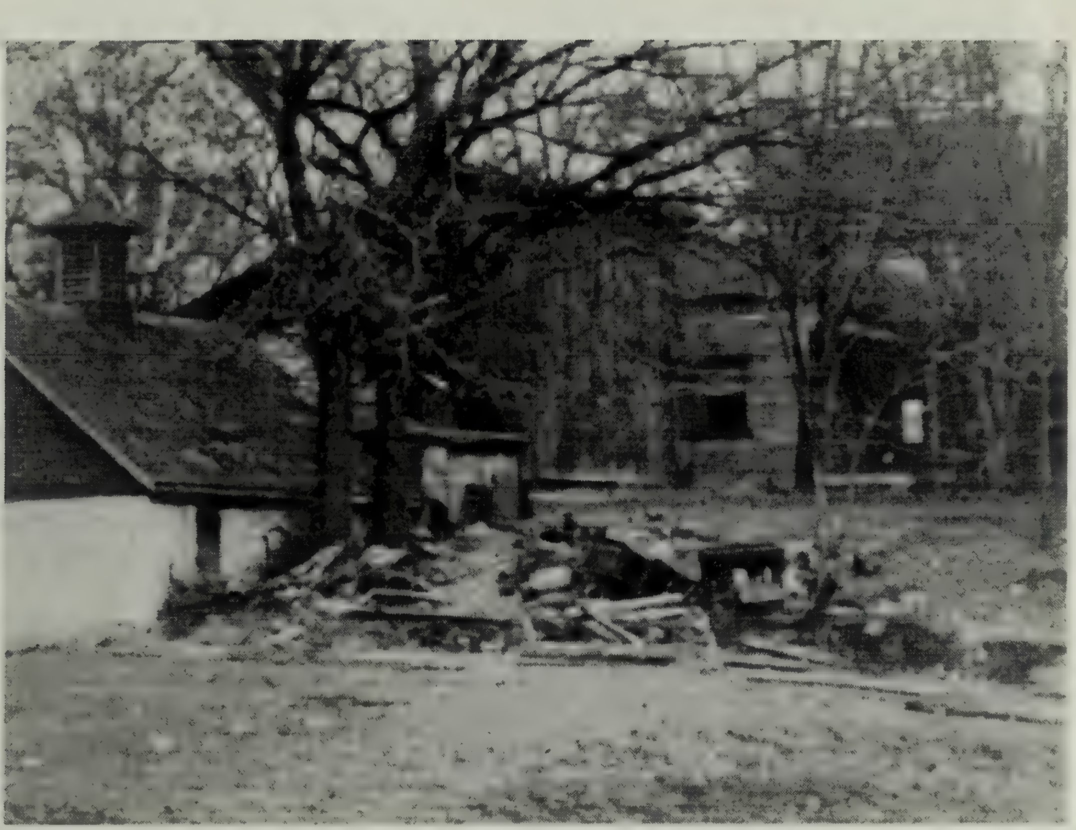


Figure 3.8 - View of the Stone Building from the northwest at the time Albert Wenzlick purchased the property in 1913. By that time the west wall had collapsed and been replaced with a wood frame wall, and the gable roof had been replaced with a shed roof. (Enlarged detail of print from Bill Wenzlick collection).

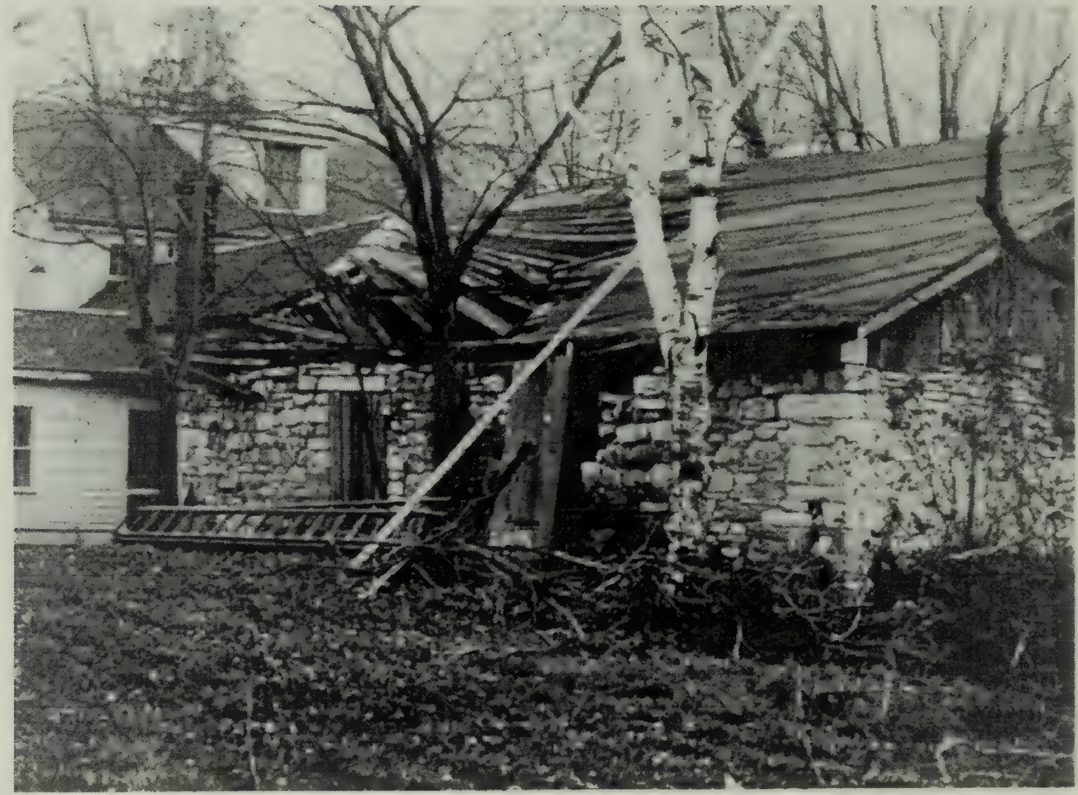


Figure 3.9 - View of the Stone Building from the northeast circa 1928. The shed roof either colapsed or was damaged by a fallen tree. (Enlarged detail of print from Bill Wenzlick collection).

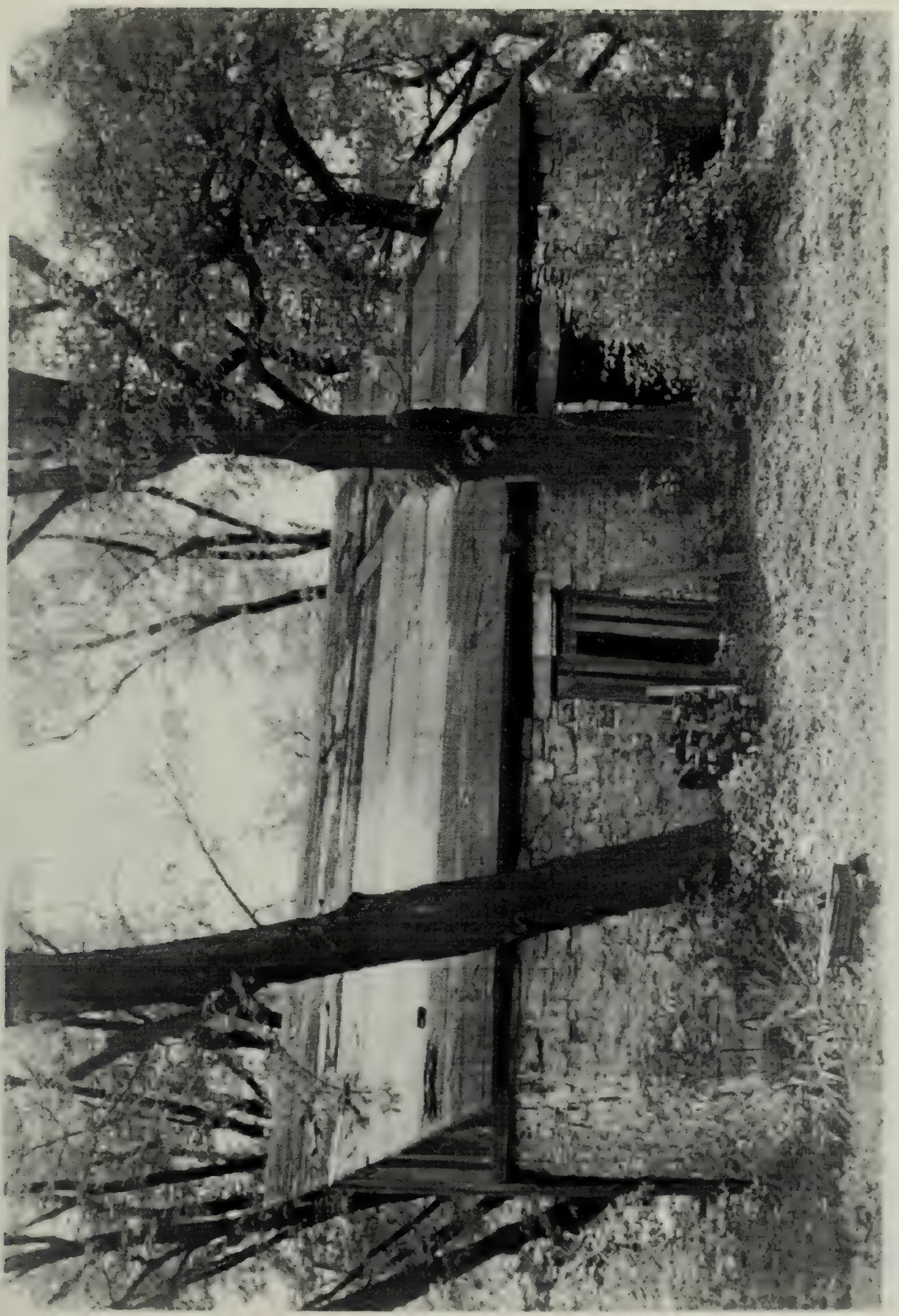


Figure 3.10 - View of the Stone Building from the southeast, 27 July, 1940. (Lester Jones, photographer. Print from HABS collection, 112179-HABS MO., 95AFT, v. 1A-1).

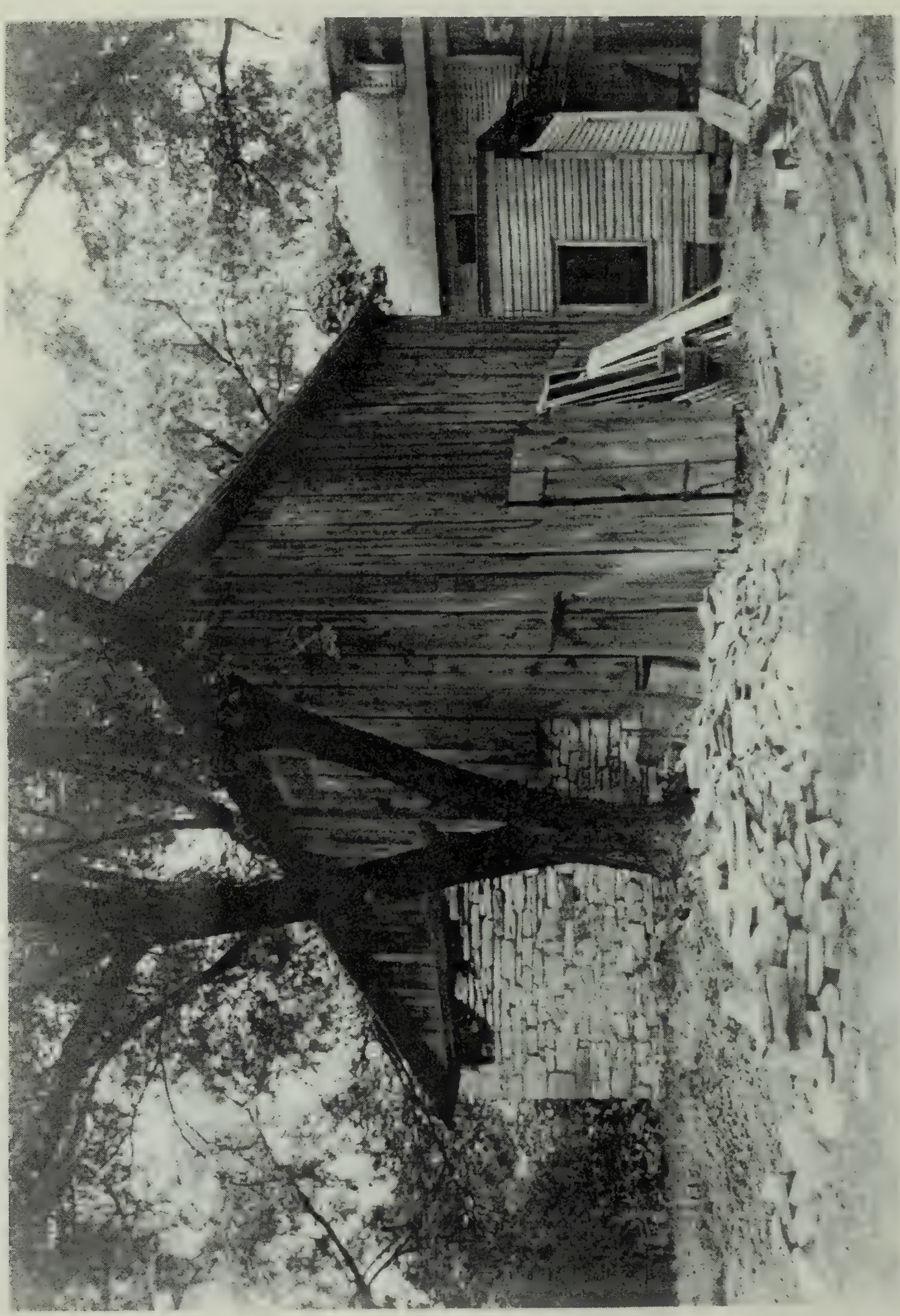


Figure 3.11 - View of the Stone Building from the northwest showing the replacement shed roof and wood frame west wall, 27 July, 1940. (Lester Jones, photographer. Print from HABS collection, 112179-HABS MO., 95AFT, v. 1A-2).

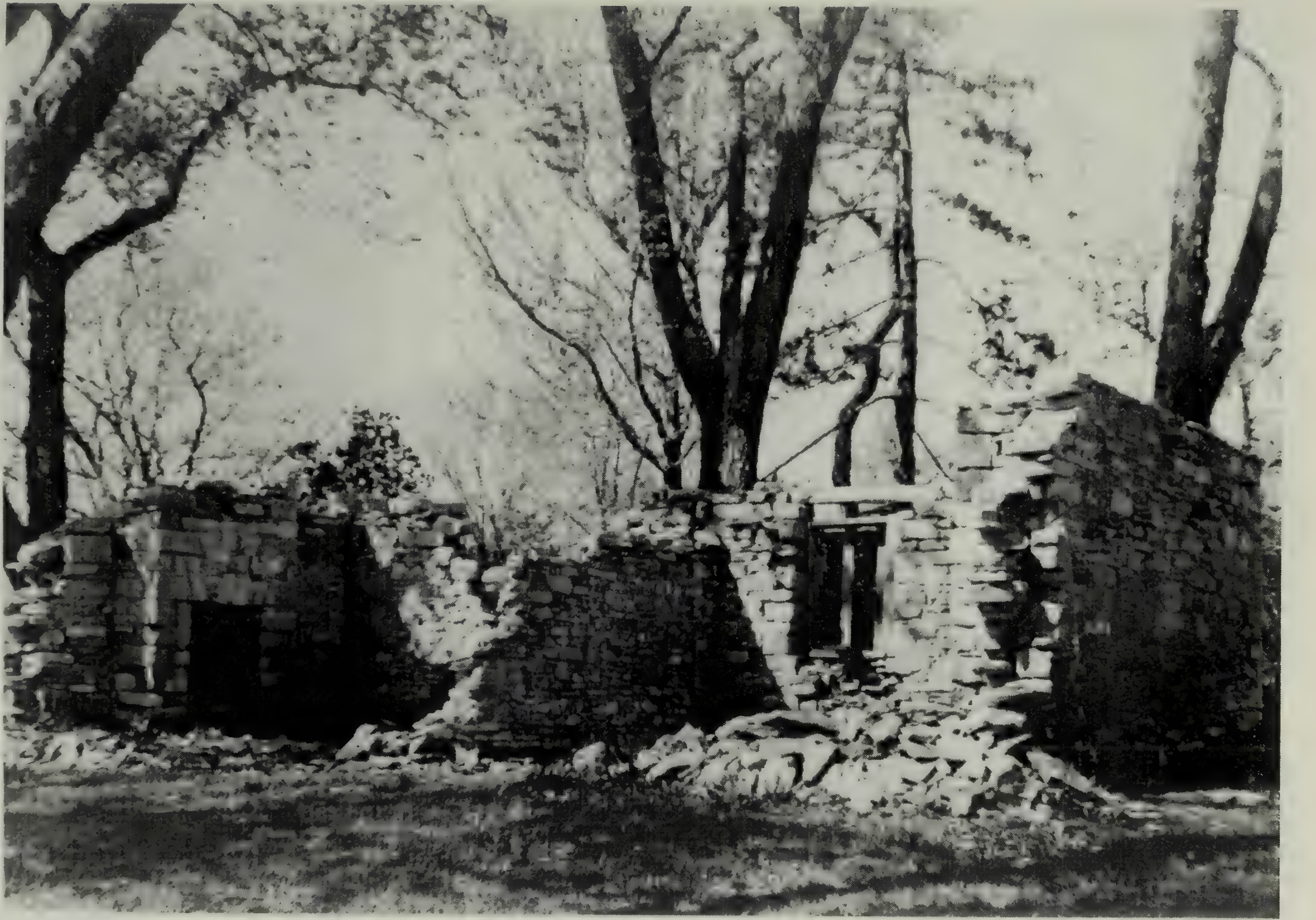


Figure 3.12 - View of the Stone Building from the southwest after removal of the shed roof and wood frame west wall, 1947. The ruined interior stone partition, south room window, and north fireplace are clearly seen in this photograph. (Print from Bill Hayes collection).

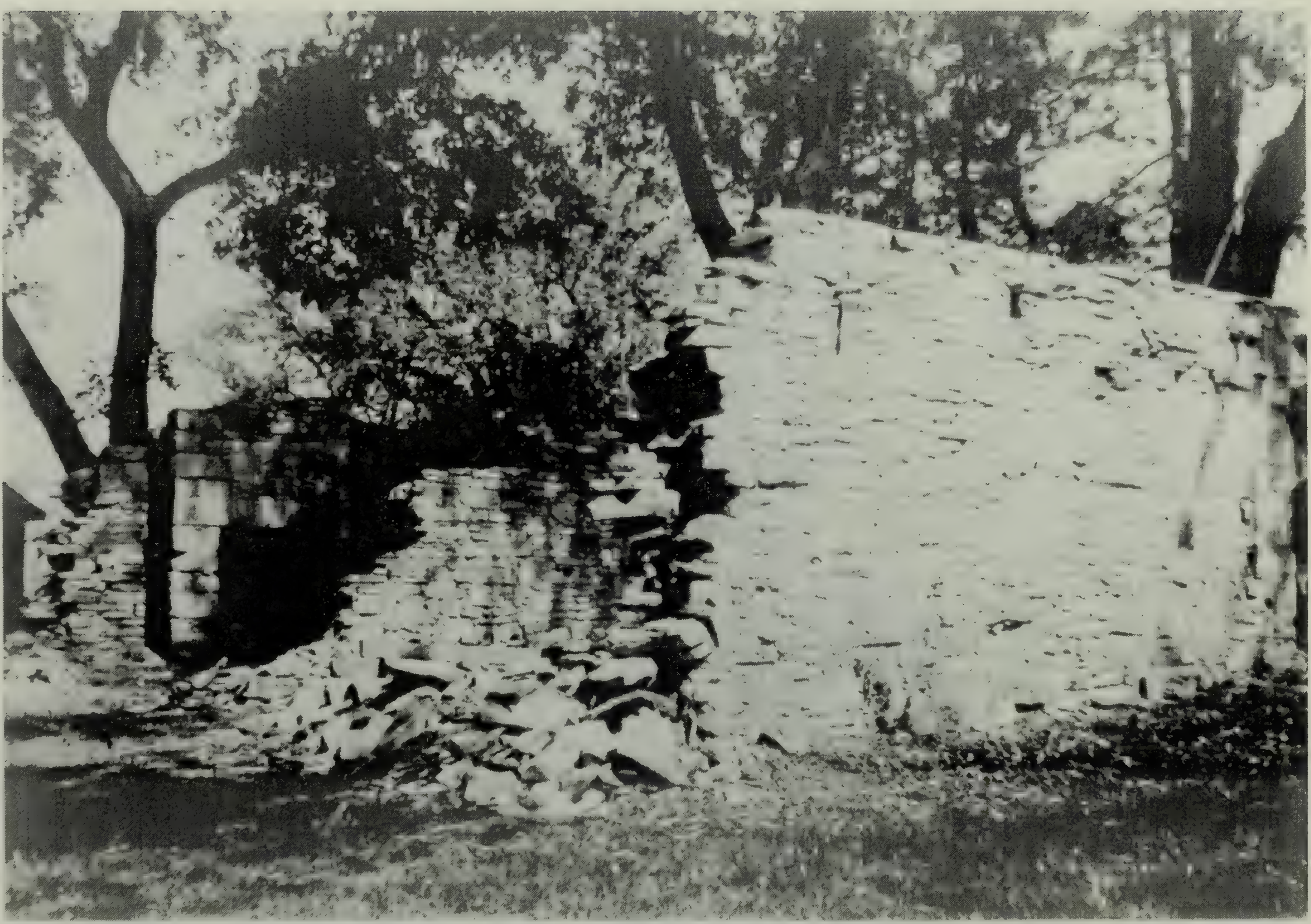


Figure 3.13 - "Whitehaven, May 18, 1947, 10:45 AM, Hayes." View of the Stone Building from the southwest after removal of the shed roof and wood frame west wall. (Print from Bill Hayes collection).

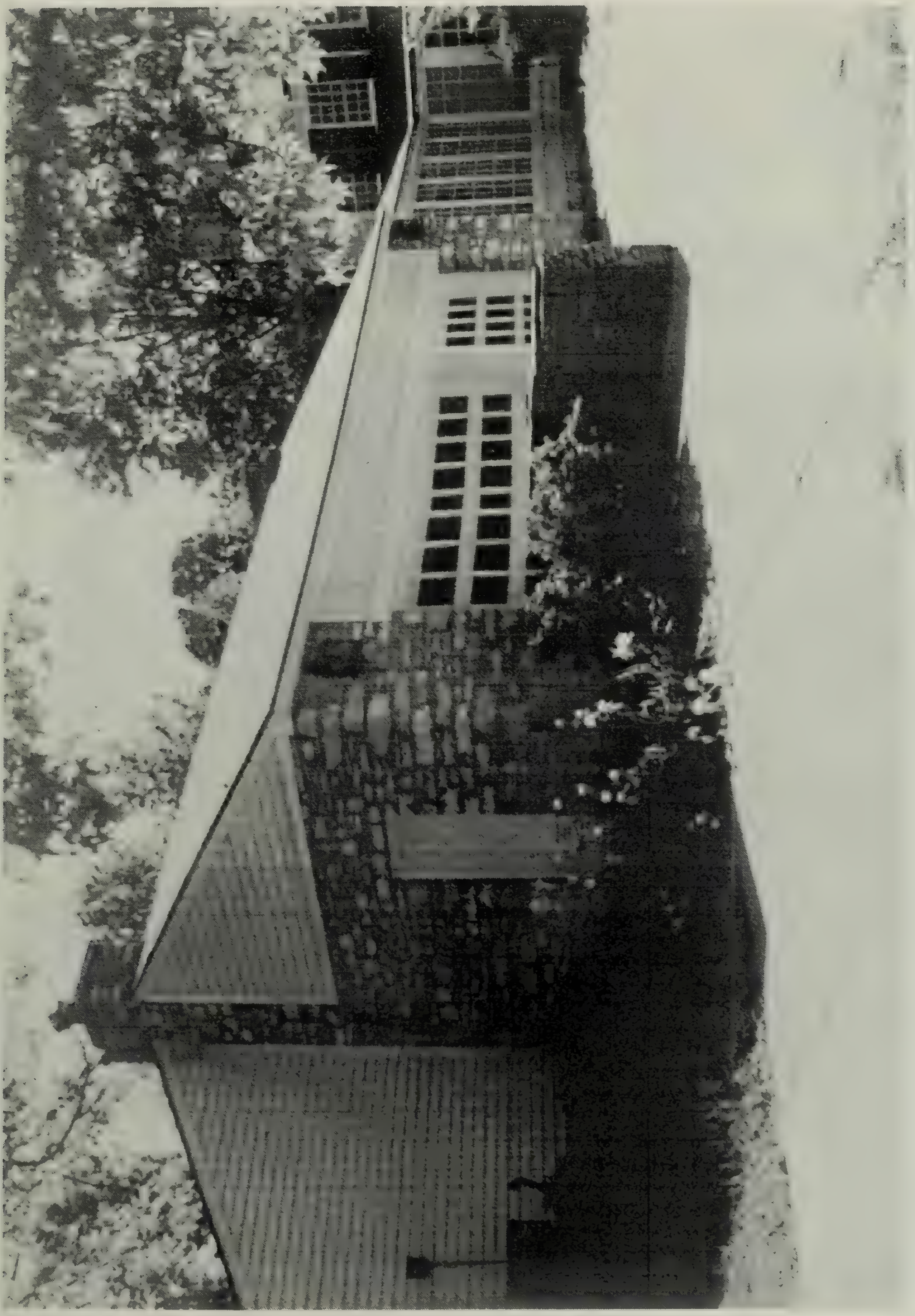


Figure 3.14 - View of the Stone Building from the northwest, May 1994. The Workshop addition is just to the left of the Stone Building. (Photo by the author, ULSG collections).

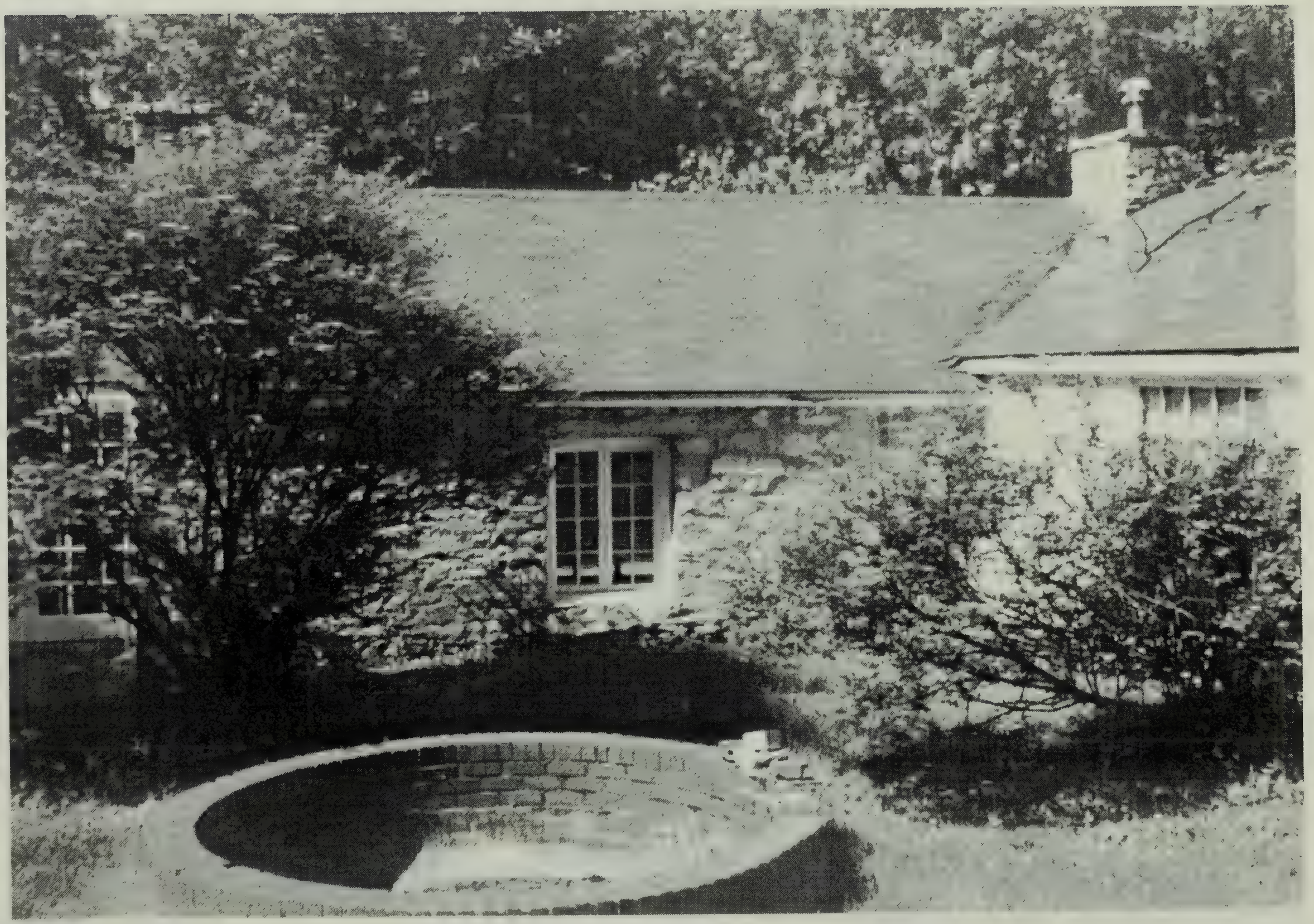


Figure 3.15 - View of the Stone Building from the east, May 1994. Note that the grade level at the east elevation approaches the window sill. (Photo by the author, ULSG collections).

ARCHITECTURAL ANALYSIS

While eighteenth and nineteenth century documentary evidence on the White Haven property is incomplete, and vague at best in some instances, documentary evidence suggests that site occupancy occurred prior to initial construction of the Main House (see Division II, Ownership History). The Stone Building was probably constructed during Frederick Dent's ownership of the property. A letter written by Anne Lucas Hunt to her father in 1818 is important in what it does not mention, just as in what it describes about the types of structures on the property at that time. She carefully related the acreage under plow and meadow, the size and characteristics of the unfinished house, the new log barn, the existence of several log cabins, and the location of the Gravois River from the house.[1] What is not described in the letter was the Stone Building, which would have been but a few steps from the house.

Since the Hunts owned the property for only two years, it is possible, but unlikely, that they were responsible for completion of the Stone Building. It is surmised that the structure was constructed by Frederick Dent between the date of his purchase of the property in 1820, and 1840 when the Stone Building appears in a painting with the house (Figure 3.1). For what purpose the Stone Building was constructed and by whom can only be assumed at this writing. However, the building may have been intended to be used as an outbuilding to support household kitchen and laundry functions for the Main House. The West Wing basement kitchen of the Main House certainly was active during the winter months as residual heat from the cooking fireplace would have provided some space heating for the house. However, kitchen functions may have been moved to the Stone Building during hot humid weather to remove an unwanted heat source from the house.

An effort was made to trace the source of local story that the Stone Building had been used to house slaves during Frederick Dent's occupation. While it is certain that the Dents held slaves who may have labored in the structure to wash laundry or prepare food, there is little nineteenth century documentation as to where slaves were housed. In a brief history of Grant at White Haven prepared around 1908 by Julia Grant's sister, Emma Dent Casey, she wrote that eighteen slave cabins were located "...some little distance behind the house..." flanking "...stables and pens for the stock..."[2] It is known that a barn or stable existed about 150 yards north of the house until it was demolished around 1920 (Figure 2.17).[3] This may be the dozen cabins on the property that Ulysses Grant ordered demolished in 1867.[4] Eighteen, or even a dozen, slaves cabins are certainly a more significant grouping of buildings than a single stone building, so there can be no doubt that the manuscript was in reference to the structures north of the creek and not the Stone Building.

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[1] Anne Lucas Hunt, Letter to J.B.C. Hunt, 28 January, 1818, St. Louis, MHS, Lucas Collection.

[2] Casey, *Grant*, 1-2.

[3] At least a portion of the roof can be seen in the extreme right of the photo. See also Division VII, Hay Barn and Stable.

[4] USG, *Papers*, 17:28.

There is some doubt as to the authorship of that manuscript. Some historians contend that Emma Marbury Dent Casey's daughter, Emma Dent Casey, wrote the piece in third person.[5] However, detailed accounts of the site and personal conversations point more in favor of Julia's sister having prepared the document.[6] By the time Emma Dent Casey was born, the slave's cabins had been demolished for over ten years under Grant's order. Perhaps confusion of identities between the two women occurred during a December 6, 1927, White Haven visit paid by the daughter, Emma Dent Casey.[7] At that time the property was owned by Albert Wenzlick who conducted tours of the site and fortuitously maintained guest logs. Perhaps erroneous stories about the Stone Building exchanged during Emma Dent Casey's visit were misunderstood by Albert or his offspring, and eventually perpetuated the slaves' quarters legend.[8] The Wenzlick family conclusion that male and female slaves were separated from each other in this building may have been due to their misinterpretation about the presence of the doorless stone partition separating the two rooms.[9] To further confuse this issue, a 1916 account by Mrs. John C. Dent contends that the Frederick Dent family owned 90 slaves at one time and that:

> The slave quarters are still almost as the Dents and the Grants left them, at the back of the house, except that a cabin inhabited by the cook has been demolished. "That was Kitty's cabin, we called it, for years and years," said Mrs. Dent. Kitty was the veteran cook of the Dents.[10]

This account could have been misinterpreted by the Wenzlicks to mean that the Stone Building was the slave quarters and that some other demolished structure was the cook's cabin. Perhaps the Stone Building could have quartered 13 slaves, but not 90 slaves as Mrs. John C. Dent contended. The article continues to describe the slave quarters in detail:

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[5] KSL, White Haven, page 66, note 2.

[6] Casey, *Grant*, 1. The manuscript states that the writer was 72 years of age at the time she wrote or dictated the paper. Since Emma Marbury Dent Casey lived between 1836 and 1920 (also confirmed in the document through association with Grant's first appearance at White Haven), the manuscript could have been prepared in 1908. If Emma Dent Casey (1874-1954) prepared the document at the age of 72, the account could have been prepared in 1946.

[7] Albert Wenzlick, "Guest Book," unpaginated. Aside from her signature, Emma Dent Casey wrote a note stating that she was the "Daughter of Emma Dent born in this house."

[8] Bill Wenzlick to the author, 2 November, 1992. Wenzlick stated that his grandfather Albert told him the story about how male and female slaves were segregated in each of the rooms of the Stone Building. He even stated that this information was recorded by Emma Dent Casey in her manuscript which is proven incorrect.

[9] Marjorie Abbott Felice, Letter to William Bodley Lane, 5 August, 1987, (inserted sketch). The enclosed sketch indicates no door between the two rooms. This is confirmed by drawings prepared in 1945 to convert the Stone Building for use as a garage (see Documentation Drawings, 1940 Stone Building Renovation Drawings), and photographs taken in 1947 (Figures 3.12 and 3.13).

[10] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 34. The Mrs. John C. Dent mentioned in the article is believed to be the second wife of John Cromwell Dent (1816-1889), the first child of Frederick and Ellen Wrenshall Dent.

> The slave quarters were largely in one big house, with lower rooms and attics above. ...the quarters are provided with stone fireplaces as deep and long as those of the "white folks."

Perhaps Mrs. Dent and the article's author were confused by the changed appearance of the Stone Building, portions of which had collapsed by 1913, and considered the structure no longer extant. However, she was adamant that the slaves quarters had changed little in appearance. But there is still puzzlement in the article's plural reference of "them" in the first quote, and continuing to describe the slave quarters as "one big house" in the second quote. Certainly the two room Stone Building was not considered a large structure. Mrs. Dent could have been referring to the large barn-like structure north of the creek, or the cabins north of the creek mentioned by Emma Dent Casey.

The contention that the Stone Building housed all of the site's slaves is also raised in a 1928 newspaper article. But the article also writes of the remains of early cabins "...where additional slave quarters may have been located."[11]

That the Stone Building served as slave quarters is expressed in the National Register Nomination for the house which states that this structure "...was originally a two-room dwelling for slaves assigned to the house..."[12] The source for that information is unknown but is suspected to have been generated by the Wenzlick family or newspaper accounts.[13]

In summary, it is questionable that the Stone Building was constructed solely for use as slaves' quarters. A more plausible scenario is that slaves were housed in cabins located north of White Haven across the creek, and that a select few household slaves labored in the Stone Building to prepare meals and perform other household chores for the Dents.

The original Stone Building falls within a building type referred to as "double-pen" which is believed to have roots in Europe and principally in the British Isles.[14] Double-pen structures characteristically feature two side-by-side rooms with gable end chimneys.[15] Their form is accepted as more important than construction material in the determination of building type because of the availability of materials will vary from location to location.[16] Usually a double-door facade resulted from one room being added to a single room structure with no passage or hall between the rooms.[17] However, presence of a double-door facade could have been aesthetically induced, too.[18]

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[11] "The Home in which Gen. Grant Courted and Lived is Still a Staunch Structure," *St. Louis Globe-Democrat Magazine*, (4 November, 1928), 15. The article states that the Dents kept 80 slaves but the source for that information is not recorded. Overall the article is rife with misinformation. For additional information regarding site slaves quarters, see Division VII, Slaves Quarters).

[12] Hamilton, National Register Nomination form, (1979), Item 7, Page 5.

[13] Marjorie Abbott Felice, Letter to William Bodley Lane, 1. Felice and her mother, Ruth Wenzlick Abbott, recalled that during Albert Wenzlick's ownership of the property they assumed that "...this was quarters for the Dent house servants, particularly the single ones, with male on one side an female on the other."

[14] Knight, *Study*, 17.

[15] Henry Glassie, *Pattern in the Material, Folk Culture of the Eastern United States* (Philadelphia: University of Pennsylvania Press, 1968), 78-79.

The use of stone in a timber-rich area is curious, but once again familiarity with ethnic construction techniques may be the reason for use of this material.[19] Tooling and laying stone requires skills distinct from hewing and framing logs. Surely whoever constructed the Stone Building must have had some masonry experience. Availability of stone was no problem as there are rock outcroppings in the creek bed just north of the structure.

The existence of two fireplaces and the permanence of stone construction suggests that the Stone Building may have originally served as a residential structure. As described above, the absence of passage between the two rooms does not necessarily imply that the structure was used for two unrelated functions, but may have in fact been intentional due to the builder's familiarity with ethnic construction techniques and living practices. It is plausible that the Stone Building began as a single room with a later one-room addition (probably the south room) that would account for the deficiency of a door between the two rooms. But there is no physical evidence of a masonry joint in the remaining stone that supports this contention.[20]

It is unknown how long the Stone Building served as a summer kitchen, but by the time the property was purchased by Albert Wenzlick in 1913 a permanent, first floor kitchen had been established in the Main House (see Division II, Historic Building Chronology, Phase V). It is inconceivable that fireplaces would have continued to be used for cooking into the 1880s with the availability of relatively inexpensive, energy efficient cast iron cook stoves by that time.[21] The Stone Building remained intact until at least 1875 (Figure 3.6) and possibly well into the 1890s, but it had partially collapsed prior to 1913 (Figure 3.8).[22] It is possible that the Stone Building deteriorated when the property was virtually abandoned and no longer maintained between 1905 and Albert Wenzlick's purchase in 1913, but that reason does not account for construction of the wood frame shed roof and west wall. It is presumed at this writing that Luther Conn was responsible for construction of the wood frame wall, and, therefore, the west wall collapsed prior to his sale of the house in 1905.[23]

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[16] Glassie, *Pattern*, 8, and Knight, *Study*, 14. Practically all of Glassie's examples are of log and wood frame structures east of the Mississippi River.

[17] Knight, *Study*, 18-19.

[18] Knight, *Study*, 20.

[19] McAlester, *Field Guide*, 76-77. According to the McAlesters , St. Louis lies within the Midland log dominance area," just south of the "mixed and transition areas," and 200 miles east of the masonry dominant dividing line.

[20] "A. Wenzlick Buys The Old Dent Home," St. Louis Globe Democrat, (11 January, 1914). This article claims that the structure had ". . . portholes used for defense in the time of Indian raids" but there is no other documentation nor physical evidence for them.

[21] Cook stoves of that period are briefly explored in Division 2 - House, Historic Building Chronology, Phase V.

[22] KSL, *White Haven*, 277-278. Julia Grant and Fred Dent Grant continued to visit White Haven after the property was acquired by Luther Conn, and in 1896 commented upon ". . . how well the-preserved the farm was" ("Old Dent Farm," St. Louis *Post-Dispatch*, 12 July, 1896; "Col. Grant Visits Boyhood Home," St. Louis *Post-Dispatch*, 30 September, 1903). If the Stone Building was in ruins by that time, it is difficult to perceive how they could have made that statement.

The cause for collapse of the west wall is speculative. Perhaps lateral bracing for the roof system became deteriorated, or was insufficiently designed to begin with, and allowed the rafters to exert overwhelming horizontal pressure on the west wall. One possible reason for collapse of the west wall may be found in the appearance of an extremely destructive tornado which swept through the St. Louis area on May 27, 1896. A weather bureau report completed that same year includes a map indicating a path of severe devastation approximately twenty miles wide across eastern Missouri and Western Illinois.[24] White Haven is located well within that path. An earthquake may be another explanation for the wall's collapse. The strongest earthquake measured since the powerful New Madrid events of 1811 and 1812 occurred on October 31, 1895.[25]

The Stone Building functioned as a seldom-used storage shed during Albert Wenzlick's ownership until his death in 1937.[26] Sometime around 1930 the shed roof partially collapsed or was damaged by a tree limb (Figure 3.9) but was repaired by 1940 (Figure 3.10). The fact that the roof was only partially protected by roll roofing and shingles may account for structural deterioration.

Delbert Wenzlick began planning for renovation of the Stone Building upon receiving the White Haven property in 1940. Around 1940 he commissioned friend and local architect Paul Klingensmith to prepared a preliminary drawing for converting the first floor into a study, adding a cantilevered second floor, and constructing a three bay wood frame garage attached to the northeast corner (see Appendix I - Previous Drawings and Sketches).[27] The design apparently did not meet with Delbert's approval as a five-sheet set of construction drawings, believed to have been completed before 1945, had numerous revisions to the first design, especially with respect to garage placement

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[23] Bill Wenzlick to the author, 2 November, 1992, and Marjorie Abbott Felice, Letter to William Bodley Lane, 5 August, 1987, ULSG files. Wenzlick contends that the shed roof and enclosure were constructed by his grandfather Albert. However, the enclosure was extant at the time the property was purchased by Albert in 1913 (see Figure 3.8), and Ruth Wenzlick Abbott recalled that the west elevation was constructed of vertical boards.

[24] H.C. Frankenfield, *The Tornado of May 27, 1896, at Saint Louis, Missouri* (Washington D.C.: U.S. Department of Agriculture, Weather Bureau, 1896), 7. In the highly detailed report on changing weather conditions, the bureau recorded 120 miles per hour wind speed in downtown St. Louis. The report listed damages in excess of $10,000,000 for the city of St. Louis, and $100,000 in damages for St. Louis County.

[25] Atkinson, *New Madrid*, 27. The 1895 earthquake was measured at 6.2 on the Richer scale.

[26] Bill Wenzlick to the author, 2 November, 1992, and James Davis to the author, 18 March, 1993. More descriptively, each indicated that the building was "full of junk."

[27] Bill Wenzlick to the author, 2 November, 1992. Klingensmith continued to prepare designs for apartments constructed in St. Louis for the Wenzlicks.

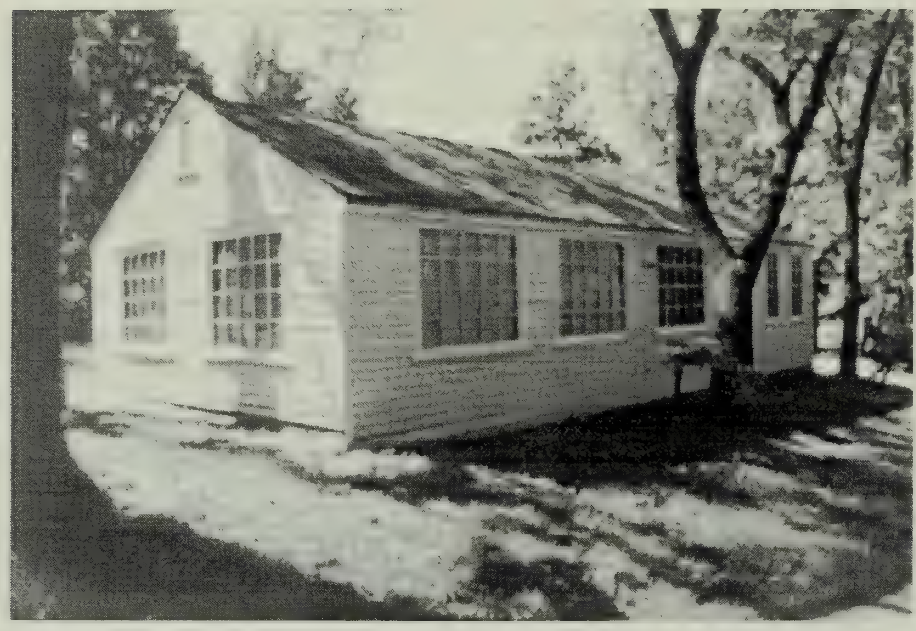

Figure 3.16 - View of the Workshop from the northeast, May 1994. The Workshop was added to the east elevation of the Stone Building around 1940 by Delbert Wenzlick, and was adapted as a park office in 1992. (Photo by the author, ULSG collections).

(see Appendix I - Previous Drawings and Sketches). That design was also rejected in favor of a more simplified layout that was constructed around 1950 and exists today (Figure 3.16).[28]

By 1947 the wood frame walls and roof were stripped off, possibly in preparation for construction work for conversion of the Stone Building for use as a garage (Figures 3.12 an 3.13). Stone was reclaimed from the collapsed west wall and demolished internal partition and used to repair the ruined walls, construct new chimney stacks, and extend the west wall 6 feet beyond the original location for accommodation of automobiles.[29] A pile of the stone presumably from the collapsed west wall can be seen in the foreground of Figure 3.11.[30] The deteriorated north window opening at the east elevation was partially infilled, and a new doorway was created for passage between the Stone Building and Workshop. Brick paving for the floor surface was placed on a thin concrete slab laid over clinker gravel, and the roof constructed of new light wood framing. An underground water pipe was laid from the house to the new workshop restroom, and a hydrant was placed at the interior of the garage connected to that line.[31] Two overhead garage doors were installed.[32] The north door had a mechanical opener that automatically opened and closed when an automobile passed over coils placed beneath the garage drive approach.[33] A tank which furnished fuel oil to the Workshop furnace was buried just north of the Stone Building.[34]

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[28] A roof plan and exterior elevations of the existing Stone Building and workshop were roughly sketched to an undated sheet of trace paper. That drawing may have been prepared just prior to construction around 1950. See Documentation Drawings, Sketch Drawing.

[29] Bill Wenzlick to the author, 2 November, 1992. Wenzlick could not recall any new stone being brought into the site for use on the project.

[30] Marjorie Abbott Felice, Letter to William Bodley Lane, 1. ". . . the earth had almost completely covered the tumbled stones." "The Home in which Gen. Grant Courted and Lived is Still a Staunch Structure", 15. "The front elevation has fallen down and may be seen buried in the earth before it."

[31] Bill Wenzlick to the author, 2 November, 1992. The water line developed a leak in the area of the hydrant during the 1970s. To repair the pipe Wenzlick excavated a large pit in the vicinity of the hydrant which may have resulted in removal and disturbance of archeological remains.

Around 1965 a natural gas line was installed to the Stone Building and Workshop through the Stone Building attic and the workshop furnace was converted from oil to gas. About that same time an incinerator was installed at the south fireplace to burn household garbage.[35] In the 1970s a pit was dug around the hydrant to repair a leaky valve.[36]

The Stone Building continued to function as a garage until the Wenzlicks moved out in 1980. St. Louis County used the space for storage upon its acquisition of the property in 1986.

From historic graphic documentation and existing physical and archeological evidence, a description of the original Stone Building can be developed. The structure measured 18 feet by 33½ feet in plan and was constructed of 18 inch thick rubble limestone walls laid in sand and lime mortar. The structure was topped with a moderately sloped gable roof; the roofing material is unknown but believed to have been hand-rived wood shingles. There were low profile chimney stacks at each gable end. It is believed that the gable end stone walls terminated at the eave line level, and that the resultant voids flanking each side of the chimney stacks were clad in siding fastened to wood framing. The roof and ceiling structure is unknown but was probably hand hewn timber. The two rooms of the one story building were separated by an 18 inch thick limestone wall that offered no passage between the two rooms; the south room measured 15 feet square and the north room 14 feet by 15 feet. One window was placed in the east wall of each room, and one door in the west wall of each room directly across from the windows. Window lintels were constructed of one or two large stones and the doors probably similarly so. The style of windows is unknown but believed to have been twelve over eight light double hung sash similar to that found in the Main House. The south room featured a massive limestone cooking fireplace. The north room had a smaller warming fireplace. Fireplace lintels consisted of jack arches formed of tapered stone voussoirs and supplemented with an iron bar. The floor in each of the rooms was probably soil but may have been planked. The walls were unfinished, but it is unknown if the ceiling would have been finished.

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32. Bill Wenzlick to the author, 2 November, 1992. Wenzlick widened the north overhead door in 1958 or 1959 as a result of his step-mother constantly hitting the stone pier that divided the two garage doors with her Chrysler Imperial. The stone pier was replaced with a wooden post.

33. Bill Wenzlick to the author, 2 November, 1992. A coil installed beneath the car floor was activated by a remote control box within the car.

34. Remaining oil in the tank was pumped out and the tank and contaminated soil removed December 1991 under a contract initiated by the NPS.

35. Bill Wenzlick to the author, 2 November, 1992. The incinerator was salvaged from an apartment building owned by the Wenzlicks. Household trash had to be burned as trash trucks could not drive over the railroad berm. The incinerator continued to operate until Delbert's death in 1979.

36. Bill Wenzlick to the author, 2 November 2, 1992. The pit destroyed any subsurface remnants of the original west wall and may have disturbed some archeological features outside of the wall.

BUILDING DESCRIPTION

The Stone Building lies just north of the Main House and historically may have been an integral part of household functions. Around 1950 the building was rehabilitated for use as a three car garage and a workshop was added to the east elevation. Consequently the Workshop is considered an extension of the Stone Building in the analysis of Division 3. The Stone Building is attached to the house by a breezeway. The building presently measures 24 feet by 33 feet in plan and is constructed of 18 inch thick rubble limestone walls. The roof structure is of light wood framing constructed in 1950. There is a large cooking fire place at the south wall and a heating fireplace at the north wall. The floors are of brick over a concrete slab, the roof was constructed around 1950 of light wood framing and asbestos cement tiles.

MATERIALS ANALYSIS

Paint

Paint analysis was performed on samples taken from exterior painted surfaces of two pedestrian doors in 1992 by Washington University Technical Associates (WUTA). The purpose of the analysis was to determine historic color systems and compare the results with paint chronologies within the house. The paint analysis indicates that doors D-1 and D-3 were salvaged from the house and integrated into the 1950 garage renovation work.

Mortar

Architectural Conservator David Arbogast analyzed four mortar samples removed from historic stone masonry. In general all bed mortars were found to contain one part lime to between two and five parts of fine sand.[37] The bed mortars in the Stone Building are distinct from those found in the Main House where mortars predominantly consist of soil. However, Stone Building mortars compare favorably with those of the Ice House, lending credence to a theory that these two building were constructed at the same time. The majority of the exposed surface joints throughout the Stone Building have been repointed with portland cement based mortar.

Wood

Analysis was performed and a report was prepared by the Center For Wood Anatomy Research, U.S. Forest Products Laboratory on one wood sample of Door D-1 (see Door and Window Opening Analysis). There are no wooden members remaining in-place from the original construction of the Stone Building.

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[37] Arbogast, *Mortar Analysis*, 6-7. Samples M-SBN-29, M-SBNE-30, M-SBNE-32, and M-SBNE-33.

Asbestos

Samples were removed and analyzed from various building materials in the Stone Building. The only asbestos bearing material is the asbestos cement roof shingles which contain between 30% and 40% chrysotile asbestos.[38] The shingles were removed in 1993.

ARCHEOLOGICAL SURVEY WORK

Archeological excavations were performed within the interior and at the exterior east elevation during Summer 1991, and again at the east exterior elevation in 1995. Within the building, the excavations were concentrated on determining the existence of the west perimeter wall and interior partition, each of which had been removed prior to 1950. Small in-place portions of each stone wall were found beneath the existing brick and concrete slab garage floor (Figure 3.17). The locations of the foundation remains were plotted in 1991 HABS documentation.

Test pits excavated at the east exterior elevation of the structure revealed that approximately two to three feet of fill overlays an early grade level composed of scrap stone. The existing grade is consistent with the grade line seen in a circa 1928 photograph of the Stone Building (Figure 3.9). According to preliminary analysis, the fill has been placed in various stages since the early nineteenth century. Foundation stone was found to be laid up directly against the outer wall of the builders' trench. Artifacts at the lowest level of test pits indicates that the site was occupied from

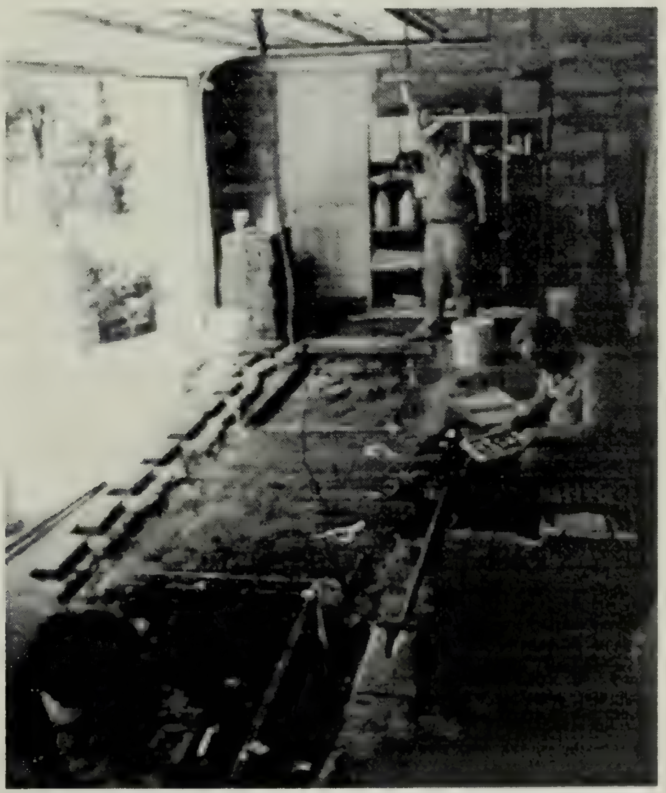

Figure 3.17- Stone Building interior archeological investigation work, 1991. Excavations revealed remnants of the former west wall which collapsed prior to 1913. (Photo by the author, ULSG collections).

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[38] ATC, 1.

around the 1810s. Preliminary artifact analysis suggests the previous existence of a structure on the same site or very near the Stone Building. The structure predated construction of the Stone Building as the Stone Buildings builders' trench cut through a deposit consisting of finished plaster and brick.[39] There is no other documentary or physical evidence on the structure.

SITE CONTEXT

The grade slopes moderately from southeast to northwest. Much fill has been placed at the east elevation prior to Wenzlick acquisition of the property (Figure 3.9). This raised grade has bulged the east elevation wall inward to the point that cracks have developed. Water emanating from the backfilled area has been seen to flow into the structure during heavy rains. The asphalt drive at the west side is adequately sloped away from the building.

Large trees growing adjacent to the Stone Building during the mid-twentieth century may have had an impact on deterioration of the building. In Figures 3.9 through 3.11 these trees can be seen growing adjacent to and perhaps even integral with the east and north stone walls. The trees were probably removed by the time work commenced on converting the building to a garage.

At present, trees and tall shrubs grow close to the east and south elevations. One tree was struck by lightning and split in half during a severe 1991 storm. Although struck by one half of the tree, the roof sustained little damage.

FABRIC SURVEY

Foundation and Walls

Through examination of a photograph taken when Albert Wenzlick purchased the property in 1913, the Stone Building had been in a state of decay (Figure 3.8). By that time, the roof had collapsed or been removed and replaced by a temporary shed roof, and the west masonry wall may have collapsed or been removed and replaced by a wood frame partition. Photographs taken of the structure in 1947 after the roof and all wood framing had been removed (Figures 3.12 and 3.13) reveal that the remaining stone walls were still in serviceable condition, although in need of repointing. A large portion of the internal masonry partition was also intact at that time.

Architectural drawings were prepared by local architect Paul Klingensmith around 1940 to adapt the Stone Building remains as a cabin or study and add a three bay garage for Delbert Wenzlick and his wife (see Appendix I - Previous Drawings and Sketches, 1940 Stone Building Renovation).[40]

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[39] Archeologist Jim Price to the author, 18 May, 1995. Plaster fragments have the imprint of stone mortar joints on one side, and a finish coating on the exposed surface.

[40] Bill Wenzlick to the author, 30 July, 1992. Delbert Wenzlick retained the services of Klingensmith, a family friend, around 1940. The construction drawings bear no date as each of the sheets are damaged at the title block. However the construction drawings indicate that a porch which is now part of the breezeway existed at the time the drawings were completed. It is believed that this porch was constructed soon after 1940

Although the design was never executed, the construction drawings shed light on the placement and extent of the masonry walls that remained at that time. The first floor plan shows that the remaining gable end walls extended about 2 feet west of the fireplaces and the interior partition ended about 14 feet from the east interior elevation. One discrepancy in the interior partition is the wall thickness indicated in the drawing in comparison with that found during 1991 archeological excavations. The drawing indicates an 18 inch thick masonry wall, while remains excavated during 1991 archeological work measured 12 inches.

Delbert Wenzlick contemplated several alternatives for use of the structure upon his acquisition of the property. Fortunately the bulk of the remaining stone walls was incorporated into the construction of a three bay garage around 1950. However, the interior stone partition was totally removed to accommodate the new use.

There is no evidence at present that the Stone Building contained a basement or root cellar. The rubble limestone walls extend approximately one foot below the existing internal brick pavement and rise nearly 13 feet above the floor surface at the eave line. There is no evidence of a spread footing. The external wall ruins that existed into the late 1940s were extensively renovated and incorporated into the extended garage walls around 1950 (Figure 3.12 and 3.13). The masonry work erected during the building's transformation into a garage matches closely to the historic masonry in material, proportion, and pattern. It is believed that the bulk of the stone used to renovate the building was salvaged off the ground from the collapsed west elevation and internal stone partition. Through comparison of historic photographs with the existing structure it was found that approximately 60-percent of the stone remains in place from the original structure.[41]

Bed mortars from the masonry that existed prior to 1947 contain a lime/sand mix in ratios varying from 1 part lime to between 2 and 5 parts sand. The sand is very fine, similar to sand found in the Main House pointing mortars and Ice House bed mortars.[42] The difference is that the Stone Building was laid entirely in lime and sand mortar while Main House stone was bedded in dirt or dirty sand-based mortar. However, mortar analysis shows that Stone Building and Ice House mortars are virtually identical, indicating that these two structures may have been constructed simultaneously. Bed and pointing mortars in the post 1947 work contain gray portland cement.

Most of the existing walls are in fair condition. The severest deterioration exists at the east wall which has bulged inward due to pressure exerted by banked soil at the exterior surface of the wall.

A crack developed during Summer 1991 at the northeast corner. The reason the crack occurred is unknown, although animals have been known to tunnel in that area beneath the floor of the

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demolition of the Hunt Addition.

[41] The calculated amount was 62-percent, but due to uncertainty about the size of the original door openings and the height of the original chimney stacks the total amount was decreased.

[42] Arbogast, *Mortar Analysis*, 6-7.

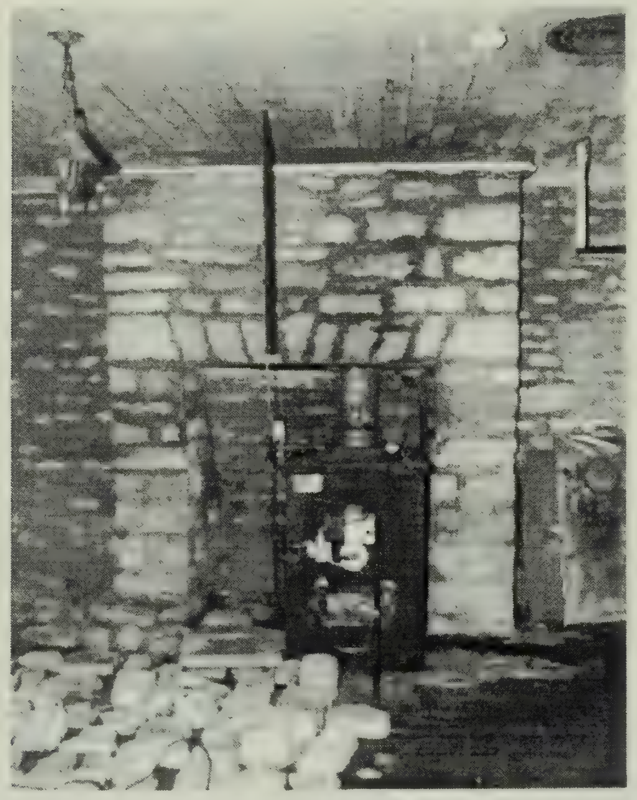

Figure 3.18 - South fireplace, May 1994. This cooking fireplace has high nineteenth century historic integrity. Gudgeons, used to support the now missing pot crane, still remains embedded in the masonry firebox. An incinerator is in the firebox vents through the chimney flue. (Photo by the author, ULSG collections).

workshop. Monitoring of movement over one year's time indicates that the crack is in a cyclical state of movement of less than one millimeter. Other cracks are also extant at the head of Door D-3 which was installed with the garage construction.

In its present footprint configuration the Stone Building will fare poorly during a sizable earthquake. In the seismic analysis report prepared for the building it is stated that:

> The presence of the two garage doors, in effect, creates a C-shaped masonry structure in plan trying to resist the seismic lateral loads. The main lateral load resisting system of this type of structure creates a large eccentricity and in turn torsional forces. The heavy stone building, even though it is small in size, has large seismic forces to resist.[43] In other words, the present shape of the Stone Building is an inherent weakness in its ability to resist an earthquake.

The entire Workshop foundation is believed to be constructed of concrete slab-on-grade with knee walls at the east and south elevations. The foundation is believed to be in good condition.

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[43] HA, *Structural*, 24.

Structural Framing System

The existing Stone Building roof and attic, and the entire Workshop, were constructed by Delbert Wenzlick around 1950 of light wood framing. Overall, the roof structures are in good condition. It is unknown if any materials used in the construction of these structures were salvaged from historic structures on the site, but there is physical evidence that much of the sheathing may have been salvaged. Analysis shows that the existing Stone Building roof will support a design ground snow load of 20 pounds per square foot.[44]

Fireplaces and Chimneys

The earliest image of the chimneys appears in a painting dating about 1840 (Figure 3.1). The image shows south and north gable end chimneys with projecting crowns and low profiles. A later engraving based upon that painting fails to show any chimneys (Figure 3.2). What may be an image of the south chimney appears in the 1860 photograph of the site (Figure 3.3). That image could be tree foliage, however. A darkened image of a chimney at the north gable end is indicated in an engraving published in 1875 (Figure 3.6). By 1913 both chimney stacks had been removed or had collapsed (Figure 3.8).

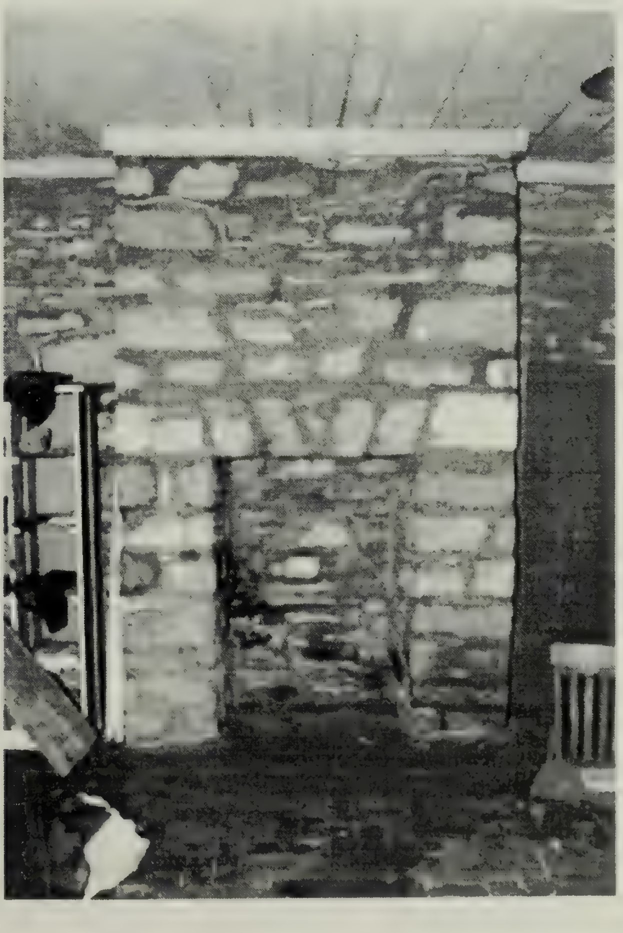

Figure 3.19 - The north fireplace, May 1994. The narrow firebox implies that it was principally used for heating. (Photo by the author, ULSG collections).

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[44] HA, *Structural*, 23.

The most reliable photographs known to exist of the fireplaces were taken in 1947 just prior to the Wenzlicks converting the structure into a garage. In Figures 3.12 and 3.13 the north fireplace can easily be seen but the chimney stack on both fireplaces are absent from about the level of the former eave line. Only a small portion of the west masonry face of the south fireplace can be seen in Figure 3.12. Comparison of stone placement seen in the photographs of the fireplaces with what exists today verifies that a high percentage of original stone remains intact.

In laying out the location of the demolished south wall, each of the fireplaces is centered with respect to the north/south axis. Each of the chimney stacks were totally rebuilt from the top of the walls up during the Wenzlick renovation work. At present, the brick garage floor extends flush into each of the fireboxes. It is unknown if the original hearths remain beneath the brick pavement.

The large firebox opening and the existence of a pair of gudgeons strongly suggest that the south fireplace served principally for cooking. At present, there is an incinerator routed into the flue, and the smoke chamber is blocked with fireproof cement board (Figure 3.18). The jack arch lintel is supplemented by an iron bar. The stone is in good condition, although joints and stone surfaces have been smeared with gray portland cement.

The north fireplace is constructed similarly to its companion, but the opening is much narrower, implying that its intended use was for space heating (Figure 3.19). Examination of the smoke chamber shows the flue is unlined. As with most masonry in the building, the south fireplace masonry is smeared with portland cement. An oil fired furnace, later converted to natural gas, was vented through the fireplace flue from the 1950s into the 1980s.

Roof System

The existing roof and trim of the Stone Building and Workshop were constructed by the Wenzlicks around 1950. Figure 3.9 shows a heavy timber plate at the top of the west wall which may have been in place prior to placement of the shed roof, but there is no other physical nor documentary evidence for how the historic roof was framed. From nineteenth century engravings of the building, it is believed that the historic roof was constructed with a nine or ten over twelve pitch roof.

Asbestos/cement shingles were removed in 1993 and replaced with strip asphalt shingles.[45] The existing roofing is in good condition while finish materials and trim are in generally good condition. Copper flashing around the chimney stacks is in poor condition.

Gutters and downspouts

The K-style gutters and smooth round downspouts were removed and replaced with galvanized steel in 1993. All components were copper and were installed by the Wenzlicks when the building was renovated around 1950. Downspouts presently terminate at the ground surface. The system is in fair condition.

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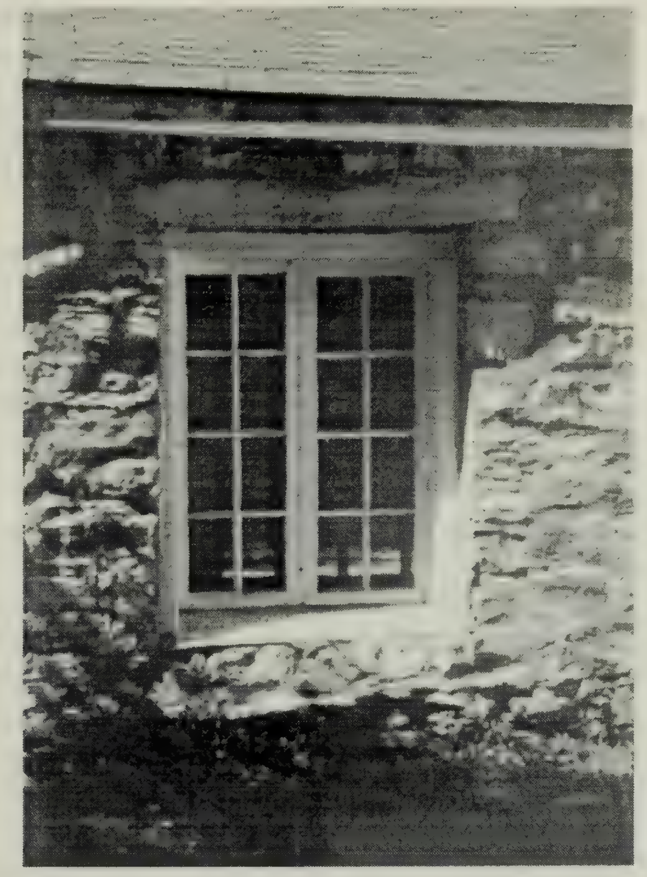
[45] ATC, 1. The shingles contained between 30% and 40% chrysotile asbestos.

Figure 3.20 - East elevation window, May 1994. This is the only remaining original opening in the Stone Building. The stone lintel is believed to be historic although it has been removed and reset. The sash and frame were constructed around 1950. (Photo by the author, ULSG collections).



Door and Window Openings

The only known nineteenth century graphic documentation of west elevation openings occurs in an 1860 photograph (Figure 3.3) and an 1875 lithograph (Figure 3.6). Figure 3.3 shows the lower half of the Stone Building and what are believed to be the jamb edges for each of two doors. The location of the door openings seen in the image are consistent with location of the east elevation windows. In other words, the doors and windows lined up directly across from one another in each room. Archeological remains of the west elevation verify that the north door was located about 9½ feet from the northwest corner of the building (see 1991 HABS drawings).

Figure 3.6 indicates four openings in the west elevation, two at the attic or loft, and two at the ground floor. The two upper windows are sized similarly to that seen in the Figure 3.5 depiction of the east elevation, although the two northern-most attic windows are not aligned with any lower openings. The south ground floor opening in Figure 3.6 is interpreted as a door, but the image of the north ground floor opening could be interpreted as either a window or door.

The earliest documentation for openings at the east elevation occurs in a painting prepared around 1840 (Figure 3.1). The painting recorded hazy images of two openings approximately equidistant from the corners, although it is unclear if the images represent doors or windows, as foliage obscures the lower third of the structure.

A later drawing from 1872 shows four distinct openings in the east elevation, three at the loft and one near the southeast corner (Figure 3.5). The upper windows are very shallow with no discernable details. The lower window is depicted in a location similar to the only remaining window on the structure. The absence of a second opening in this elevation is curious although there are numerous errors and deletions throughout this lithograph accredited to "artistic license."

By the time the Wenzlicks purchased the property the west wall had collapsed and was replaced by a wood frame wall with vertical board siding. However, two ground floor openings remained in original positions in the east elevation until the structure was adapted as a garage about 1950. A photo taken around 1928 clearly shows an opening in the same location as the window that exists today and another opening in a location similar to one that now provides access between the garage and workshop (Figure 3.9). The south opening featured a stone lintel but no other details are evident as the window was boarded up. A four panel door which leaned against the north opening suggests that the door came from the opening, but it may have been there merely to block the opening.

In a photo taken in 1947, the south opening is clearly a window (Figure 3.12). The unadorned 2 inch thick wooden sill, jambs, and head were still extant at that time, although they seem to have settled away from the stone lintel probably due to deterioration of the sill. Unfortunately, the north opening was concealed in the photograph. In the most revealing film taken of the Stone Building around 1947, each of the openings are clearly shown as windows.[46] However, the stone around the north window was severely deteriorated at that time.

Comparison of existing stone work with early photographs taken when the structure was in ruins indicates that the bulk of original stones remain around the jambs of the south window, but only a few stones remain at the south jamb of the north window. The original exterior stone lintel is in place at the south window, although it was supplemented with a steel lintel during 1950 work. The bulk of the original north window opening was infilled, and a new door opening built to provide access into the Workshop.

No original wooden members remain for the window openings, the south casement window with a supplemental steel lintel was installed by Delbert Wenzlick during garage conversion work (Figure 3.20). A photograph taken in 1940 (Figure 3.10) shows a portion of the jamb and head casing for the south opening but little else. The north opening is shown with a wooden or stone lintel placed over a thin board. There is no indication that the original window style was double hung or casement. There is no evidence of hardware or even screw holes on the north casing which would suggest that shutters were ever on the windows. However, it is interesting to note that the Stone Building finished window openings were about the same size as the historic double hung windows in the house; 36 inches by 56 inches.

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[46] Bill Wenzlick informally to the author. Both openings functioned as windows.

There is no existing physical or photographic evidence that attic windows existed in the Stone Building. In comparing historic photographic evidence of stone wall height with what exists today, it is doubtful that loft windows ever existed simply because there is not enough space to squeeze an attic floor structure and attic windows in the space between the window and door lintels and the eave line.

Workshop windows are constructed of fixed, multi-pane wood sash with a single pane at the interior. The windows are generally in poor condition.

Two existing door leafs on the Stone Building were installed when the structure was converted to a garage, but still merit analysis. The door leaf of door D-1, between the breezeway and garage, is detailed identically to the doors in the Long house, although it is a nine panel rather than a six panel door. According to Bill Hayes, this door was stored in the house attic during the 1940s, and was assumed by the Wenzlicks to be the original front door on the house, prior to its replacement with the 1840s period door that now exists.[47] A 1940 photograph confirms that this door was indeed stored in the attic (Figure 2.36). Apparently the Wenzlicks salvaged the door leaf and incorporated it into the garage. The door is constructed of white pine and is in good condition.[48] The existing cast iron rim lock is a second generation lock installed on the door and is in fair condition. The hinges are of contemporary make.

The four panel Door D-3 was salvaged from the Main House. A layer of turquoise paint found on the door places the door in Room 4 indicated by the 1940 HABS drawings (see Division II, Room Finish Survey, Dressing Room 106). This door matches the detailing and construction of a door found in the loft room of the Barn. The lower panels were severely damaged during a burglary in 1991. The cast iron rim lock and the contemporary steel hinges are in poor condition.

Door D-2 and the two overhead garage doors were installed when the Stone Building was converted to a garage around 1950. The south garage door is inoperable.

All of the Workshop panel doors are believed to date to the construction of the Workshop. Except for the battered north exterior door, all of the doors and hardware are in good condition.

Interior Finishes

Other than a small patch of sand/lime mortar found on the north interior wall just east of the fireplace, there is no physical evidence that the interior walls historically had any plaster or painted finish. The patch consists of one part lime to three parts sand, not unlike the bed mortars throughout the building.[49] This surface coating may have been the result of an early masonry repair episode, rather than an intentional surface finish.

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[47] Bill Hayes to the author, 10 December, 1991. Delbert Wenzlick's second wife, Lila Metcalf, told Hayes that the door was originally on the front of the house. Where she got that information is unknown.

[48] Alden, sample W-SB-62.

The existing ceiling is finished in a tongue and groove beaded board installed by the Wenzlicks. There is no physical nor documentary evidence as to the historic ceiling finish but it is deduced that given the crudeness of the structure, the loft joists and floor system were probably exposed.

Archeological excavations completed in 1991 uncovered no evidence for any historic floor finish system other than a dirt floor. Flagstone or wood plank could have been historically used as a floor finish, but there is yet no evidence to support this contention.

The Workshop interior walls are finished in stained novelty vertical boards and the ceiling in beaded board. A wood strip floor is laid directly over wood framing. The utility room and restroom are finished with gypsum board, and the floors are of concrete.

Mechanical and Electrical Systems

A water supply line passes diagonally beneath the floor of the Stone Building from the southwest corner to workshop restroom. A cast iron water spigot located between the garage doors is apparently serviced from that line. The line continues to service a hose bib within the Stone Building and the Workshop restroom.

A natural gas line passes through the attic from the southeast corner of the structure to the old Workshop furnace. The line is believed to be serviceable but the furnace is not.

An underground oil tank was removed by contract from just north of the northwest corner of the Workshop in 1991. Apparently, the tank was installed when the Workshop was added around 1950 to provide fuel for the furnace. Some soil surrounding the tank had become contaminated with oil which seeped from holes in the tank. The contaminated soil was removed and disposed of off-site and the void backfilled with soil brought in from elsewhere.

The Workshop was furnished with central heating and air conditioning by the Wenzlicks. The aged components were replaced with a central air conditioner to provide a comfortable setting for a Summer 1991 HABS team documenting the site historic structures. Electric coils were added to the unit in 1992 to provide heat when the Workshop was converted to office space.

All electrical systems were disconnected in 1991 due to their poor condition. However, a 40 ampere cable installed in 1991 passes through the attic from the Main House to the Workshop. This cable serviced the Workshop electrical system, and the Main House and Workshop security systems until its disconnection in 1992. A new underground 200 ampere service line was installed to service the Workshop when it was converted to office spaces.

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[49] Arbogast, *Mortar Analysis*, 10.

Miscellaneous Equipment

An incinerator is vented through the south fireplace chimney. The incinerator and fire board in the chimney throat is free of asbestos.[50] The automatic garage door opener is wired to a subsurface detector in the driveway approach in front of the garage door. It is no longer operational.

DOCUMENTATION DRAWINGS

The first known drawing which includes the Stone Building was produced by the Historic American Building Survey in 1940 (see Appendix I - Previous Drawings and Sketches for reductions of this set and the following sets of drawings). On Sheet 1, the Stone Building is presented as a simple rectangle plan with no dimensions. The reason why HABS almost totally neglected this significant structure is unknown. The HABS crew also took two important photographs of the Stone Building (Numbers 1A-1 and 1A-2).

The Stone Building is included on for four sets of other drawings. A series of three design sketch drawing boards, principally prepared for the Main House, are believed to have been completed around 1940 for Delbert Wenzlick. The designer/artist is not indicated on the drawings. One board in particular shows the west elevation of the Stone Building with two exterior doors. Another drawing board perspective shows the Stone Building with a jettied second floor addition.

A five sheet construction drawing set produced between 1940 and 1945 by Paul Klingensmith & Associates presented a design to adaptively use the Stone Building as a cabin and construct a second floor "shop" and three bay garage in the area now occupied by the Workshop. More importantly, the first floor plan shows the stone walls extant at that time.

A single, preliminary design drawing dated September 20, 1945 and produced by the same firm shows how the Stone Building was to be adaptively used as a "study" with a garage addition.

An undated and untitled sketch drawing shows exterior elevations and roof plan of the Stone Building and workshop as it now exists.

The Stone Building was again recorded by HABS in 1991 as an attachment to the Main House.

RECOMMENDATIONS FOR FURTHER RESEARCH

Archeology

The intensity of archeological investigations is dependent upon the chosen treatment alternative. Obviously, if Alternative 1 is selected, then archeological investigations will be limited to the eastern elevation which requires structural stabilization and drainage work. Selection of Alternative 2, or restoration, will require much more extensive archeological investigation and mitigation work. Archeological investigation work prior to demolition may take place in the following areas:

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[50] ATC, samples 8113-91 and 8113-98.

Floor - Investigate remaining artifacts, fireplace heaths, and stone wall remains beneath brick floor.
East Elevation - Excavate the builders' trench prior to structural stabilization and drainage work.
West Elevation - Test areas beneath the driveway approach.

Architecture
Although a thesis was developed to explain the existence of the Stone Building, more research work is necessary on nineteenth century summer kitchens.

PART 2: TREATMENT AND USE

TREATMENT ALTERNATIVES

Treatment alternatives are relatively limited for the Stone Building given its small size and type of construction. The available alternatives presented below parallel those for the Main House because of strong functional and historic ties between the two buildings. Because the Stone Building is tethered to the Main House via a circa 1950 breezeway, the two buildings are currently treated as a single structure according to the National Register nomination for the site. Dissimilar treatment reflecting two diverse time periods between the two structures would leave a confused image with the visitor; a treatment alternative which is strongly not encouraged

Treatment Alternative 1
Preservation

In this alternative, the structure would remain in relatively the same configuration as exists today, except improvements and repairs would be made to deficient systems for the long-term preservation of the building. The Workshop addition would remain intact also, as it was constructed at the same time the Stone Building was adapted as a garage. The structure can be used for a maintenance garage or storage space, or be incorporated into interpretive schemes. The advantages of this alternative include that nearly all remaining historic material (masonry and the bulk of archeological features) would remain intact, and the retention of the Workshop for continued supplemental park office space or maintenance workshop. The disadvantage is that the structure would be presented principally as a twentieth century structure. The following are treatment recommendations for the preservation of the Stone Building.

Foundation and Wall Systems

The entire perimeter stone wall and fireplaces would be underpinned with a reinforced concrete footing for the structure to better resist seismic loads. A steel framework may also be needed to reinforce the garage door openings. The east wall will require extensive reinforcing and repointing, as there is physical evidence of lateral movement at the base of the wall due to soil pressure. The remainder of the stone walls will require spot pointing and infilling of cracks. Perimeter drainage pipes would be installed at the east wall to relieve water pressure during heavy periods of rain.

Fireplaces and Chimneys

The fireplaces require spot pointing and long-term monitoring of masonry cracks and the condition of iron lintels. The incinerator would be removed from the south fireplace. Chimney flues would be capped to prevent the entry of rain and animals.

Roof Systems

The existing asphalt shingles would be replaced with cement shingles matching closely to asbestos/cement shingles removed in 1993. Sheathing would be inspected and replaced where required. All flashing, gutters, and downspouts would be replaced.

Doors and Windows

All existing doors and windows in the Stone Building and Workshop shall remain in place and be repaired to a serviceable and secure condition.

Interior finishes

The rough stone walls shall remain as existing with spot pointing as required. The beaded board ceiling would be painted. The floor can remain with a brick surface, but repairs will be required where archeological work has been performed. In the Workshop the existing board finishes can remain in place or be covered with gypsum wall board to prevent air infiltration.

Mechanical and Electrical Systems

If the Stone Building is to be used for storage of vehicles or maintenance equipment, elaborate measures for heating or cooling need not be undertaken. Consideration would be given to converting the Workshop electric heating system to gas. Although the current gas pipe appears to be serviceable, consideration would be given to replace the existing line to ensure that the pipe is routed away from and not through the Stone Building attic.

Although the Workshop is currently furnished with a small restroom, long-term use of the structure will require the installation of handicap accessible facilities. Installation of new water and sanitary lines is highly recommended.

A dry-pipe sprinkler system would be installed in all spaces to prevent catastrophic loss of the resource. The system could be tied directly to the house sprinkler system.

New electrical service will be required for the Stone Building to power new lighting and receptacles. All existing power systems would be removed.

The existing hard-wired fire and security system is functional and can remain in place.

A certified lightning protection system would be installed. The conductors can be concealed in the attic space but would be exposed in two locations at the exterior.

Accessibility

The Stone Building is not accessible in its existing condition. However, the problem can be remedied through the activation of the remote control garage door opener to gain access directly off the driveway. Extensive ramps or a lift would be required at either one or both of the internal stairs to the breezeway or Workshop areas if the Stone Building would be included on an interpretive loop through interior spaces.

If the Workshop area is to be used for long-term office space, a ramp would be constructed at the north entrance and accessible restroom facilities would be made available.

Cost Estimate

Alternative Treatment 1 - Preservation
Stone Building (HS-2)
Ulysses S. Grant NHS

The following table summarizes Class C cost estimates associated with the preservation of the Stone Building and Workshop addition. All work is assumed to be accomplished by contract labor. These estimates reflect 1995 costs for completion of the proposed alternative. If implementation of a proposed treatment is delayed, the following figures must be reviewed and revised on an annual basis to include cost adjustments for material and services inflation.

Category	Description	Cost
Site	Grading, walks	$3,800.00
Structure	Repair east elevation, stabilize roofs, seismic reinforcement, waterproofing, perimeter drainage	$80,900.00
Exterior	Remove and replace roofing, gutters and downspouts, repair siding, chimney caps, painting	$19,200.00
Doors & Windows	Repair and paint existing doors and windows	$8,700.00
Interior Finishes	Remove equipment, repair garage floor voids, construct attic fire walls	$3,700.00
Mechanical	Install workshop gas furnace, new water, gas, and sewer lines to workshop restroom, enlarge workshop restroom, fire protection	$22,300.00
Electrical	Remove existing and install new system in Stone Building, lightning protection	$3,200.00
Security	Intrusion detection and alarm, fire detection and alarm	$1,500.00
	Subtotal	$143,300.00
General Conditions	Insurance, temporary utilities, mobilization, equipment (10%)	$14,330.00
	Subtotal	$157,630.00
	Profit and Overhead (15%)	$23,644.50
	Subtotal	$181,274.50
	Contingency (15%)	$27,191.18
	Total (Construction)	$208,465.68
A/E Title II	Structural, mechanical, and electrical construction documents	$8,598.00
WASO Contingency	(31%)	$64,624.36
Archeology	Archeological mitigation	$30,000.00
	Total (Construction, Design, Inspection, Archeology)	$311,688.03

Treatment Alternative 2
1875 Restoration

In this alternative the structure would be restored to the same nineteenth century period as the Main House for the purpose of interpreting nineteenth century life at the site. The Stone Building would be detached from the house through demolition of the breezeway; the Workshop addition would be removed as well. Extensive construction work will be required to restore missing masonry walls, reconstruct the roof, and relocate doors and windows. Archeological involvement will be heavy prior to and during the course of construction work. The advantage of this alternative is that the Stone Building will be presented in its nineteenth century appearance, complementing the restoration of the Main House. Disadvantages include the potential loss of existing historic masonry and archeological resources. The following are treatment recommendations for the restoration of the Stone Building.

Foundation and Wall Systems

In Alternative 2, extensive work would be required to restore the existing stone masonry walls, reconstruct removed walls, and unite the old with the new work. In addition, it is highly recommended that remaining historic masonry walls and the fireplaces be seismically reinforced by underpinning.[51] New masonry work would be slightly recessed at the interior to differentiate it from the old work. Portland cement based pointing mortar would be removed from existing wall surfaces where possible and repointed with more appropriate mortar. Stone salvaged during removal work would be reincorporated into the new work, as it is suspected that most, if not all, of the stone came from the structure. As with Alternative 1, the east wall will require extensive reinforcing and repointing as there is physical evidence of lateral movement at the base of the wall due to soil pressure. Perimeter drainage pipes would be installed at the east wall to relieve water pressure during heavy periods of rain.

Fireplaces and Chimneys

The fireplaces require spot pointing and long-term monitoring of masonry cracks and the condition of iron lintels. The floor surrounding the fireplace would be archeologically excavated to uncover any historic hearth remains which may underlay the existing brick and concrete slab floor. The incinerator would be removed from the south fireplace. The existing chimneys were reconstructed in 1950 and appear to be serviceable. However, the chimney flues would be capped to prevent the entry of rain and animals.

Roof and Ceiling Systems

The entire existing roof would be removed and totally replaced with a gable roof of pitch similar to that found in nineteenth century engravings. The roof would be framed with contemporary structural lumber sized and reinforced to code. Fire retardant impregnated, sawn wood shingles would be installed over spaced sheathing.

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[51] HA, *Structural*, 25.

While gutters and downspouts were probably never installed on the Stone Building until 1950, they would be installed in this alternative. Poor drainage patterns particularly at the east elevation dictate that gutters be installed at the east elevation to prevent moisture from entering the building.

The historic appearance of the ceilings is speculative as there is no documentary nor physical information for them. It is unknown if the ceiling were open or plastered, or what type of structural system may have existed. Therefore, the ceiling would be treated as a contemporary element for the conveyance of lighting and security systems. The ceiling could be plainly plastered with no adornment and the fixtures mounted flush with the ceiling or suspended to illuminate exhibits or highlight architectural elements. Some means to access the attic is required however. This could be accomplished with a wooden access hatch reached only through the occasional use of a ladder.

Doors and Windows

Although there were two doors opening off of the west elevation, one to each room, their exact historic placement, size, and appearance is unknown. The doors would be placed directly opposite the location of the east elevation windows (see Architectural Evaluation) and the door widths at least conform to accessibility standards. Panel doors similar in style to those found in the Main House can be installed. Hardware would also be simple. A cast iron rim lock with porcelain knobs and cast iron butt hinges.

The north window opening would be restored to its original location and the south window opening repaired. As indicated in the architectural analysis, there is no documentary nor physical information on the style of the former windows. However, because the finish window opening is comparable in size to the Main House windows, multi-pane double hung windows similar to those on the Main House would be installed.

Interior Finishes

The interior surfaces of the stone walls would remain exposed, as there is no indication that any finish had ever been applied. The ceiling would be plastered and treated as a contemporary element, as there is no evidence for how the ceiling ever appeared.

There is no archeological evidence that the floor had been anything but dirt until installation of the existing concrete and brick floor in 1950. Therefore, the existing floor material would be removed and replaced with compacted dirt. If compacted soil is seen as too coarse or disadvantageous in terms of maintaining exhibits, a rough concrete floor simulating dirt in texture and color can be installed. Stone thresholds would be installed at the doors to prevent foot traffic erosion and night time entry of burrowing animals.

Mechanical and Electrical Systems

Only rudimentary mechanical and electrical systems would be installed in keeping with the simplistic nature of the Stone Building. If it is determined that cold weather space heating is required, a radiant heating system would be installed in the plaster ceilings or concrete slab floors. Forced air systems require the placement of vents and ducts which would diminish the visual qualities of the space and possibly create problems with dust from the dirt floor. A cooling system is also not recommended because system noise would detract visitor experience. The interior would feel cooler than hot daytime summer air in any event, due to the massive stone walls and dirt floor.

All spaces would be sprinklered to protect the resource. The water supply can be treated as a branch line from the main house sprinkler system.

Minimal electrical receptacles would be installed to operate incidental lighting or maintenance equipment. The receptacles can be concealed in the stone face of the walls. All lighting would be placed at the ceiling to highlight exhibits and architectural elements. Lighting and security controls can be located in a centralized box behind one of the entry doors. The box cover lid could be camouflaged to match the surrounding stone surfaces.

A security system of motion/infrared detectors would be installed.

A certified lightning protection system would be installed. The conductors can be concealed in the attic space but would be exposed in two locations at the exterior.

Accessibility

There would be no barriers to accessibility, because the doors will be designed to meet existing standards, and the ground floor spaces will be nearly level with the exterior grade.

Cost Estimate

Alternative Treatment 2 - 1875 Restoration
Stone Building (HS-2)
Ulysses S. Grant NHS

The following table summarizes Class C cost estimates associated with the restoration of the Stone Building to a mid to late nineteenth century appearance, and removal of the Workshop addition. All work is assumed to be accomplished by contract labor. These estimates reflect 1995 costs for completion of the proposed alternative. If implementation of a proposed treatment is delayed, the following figures must be reviewed and revised on an annual basis to include cost adjustments for material and services inflation.

Category	Description	Cost
Site	Driveway removal, grading, walks, seeding	$5,500.00
Structure	Remove workshop and stone walls, excavation, new foundation, repointing, seismic reinforcement, waterproofing, perimeter drainage	$128,400.00
Exterior	Roof and endwall construction, gutters and downspouts, painting siding and trim	$18,500.00
Doors & Windows	Reconstruct new doors and windows, paint	$8,300.00
Interior Finishes	Remove brick floor and miscellaneous equipment, install plaster ceiling	$8,700.00
Mechanical	Fire protection	$5,500.00
Electrical	Radiant ceiling heat, electrical and lighting systems, lightning protection	$15,300.00
Security	Intrusion detection and alarm, fire detection and alarm	$1,100.00
	Subtotal	$191,300.00
General Conditions	Insurance, temporary utilities, mobilization, equipment (10%)	$19,130.00
	Subtotal	$210,430.00
	Profit and Overhead (15%)	$31,564.50
	Subtotal	$241,994.50
	Contingency (15%)	$36,299.18
	Total (Construction)	$278,293.68
A/E Title II	Structural, mechanical, and electrical construction documents	$11,478.00
WASO Contingency	(31%)	$86,271.04
Archeology	Archeological mitigation	$40,000.00
	Total (Construction, Design, Inspection, Archeology)	$416,042.71

DESIGN DEVELOPMENT

The site General Management Plan has directed that Treatment Alternative 2 be implemented. This treatment would complement the recommended treatment for the Main House. While details of some elements such as ceiling, door, and window appearance are unknown, these elements can be constructed based upon detail character found in the Main House. Location of door and window openings, and the west wall can be derived from archeological, physical, and photographic evidence. The recommendations specified above in Alternative 2 should be implemented with the following revisions:

- A dirt floor should be installed rather than a concrete slab. During team discussions of floor treatment alternatives, it was felt that visitors should be able to experience the trials of nineteenth century living standards as much as possible. Because of the possibility of soil and mud being tracked into the Main House by visitors after viewing the Stone Building, rubber mats could be thrown over traffic ways during rainy days. In historic Williamsburg, oxen blood swept into dirt floors provides a hard and durable surface. This technique could be used in the Stone Building to control dust.

- Since the dirt floor is to be installed there will be no opportunity to place an efficient radiant heating system beneath the floor surface. Preliminary heat loss calculations indicate that a ceiling electric radiant heating system will only provide enough energy to raise air temperature to just above freezing during cold winter weather. Therefore, installation of a forced air heating system is a necessity. It is recommended that supply vents be place at the ceiling near the interior stone partition, and return air be ducted through the fireplace opening and up the flue to an attic duct piercing the chimney stack. System noise will be reduced through the specification of quiet fans and insulated ducts. A geothermal system which shares the Main House ground loop will be installed to reduce long-term energy costs; the air handling unit will be placed in the attic space. Pipes servicing the unit will be placed in a chase constructed in the new stone masonry wall.[52]

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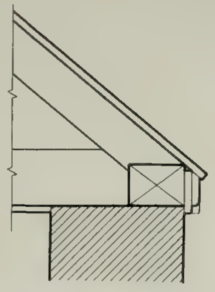
[52] HA, *MEP*, 8.

DESIGN DEVELOPMENT DRAWING



TYPICAL EAVE DETAIL
SCALE 1 1/2" = 1'-0"
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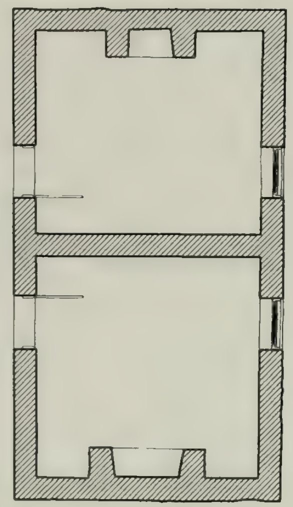

FLOOR PLAN
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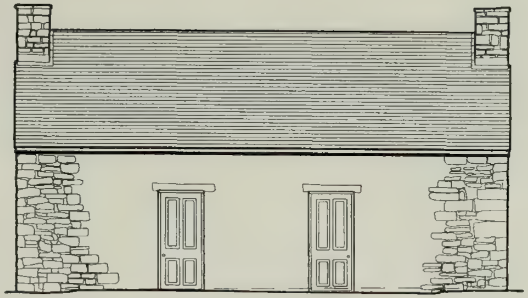

WEST ELEVATION
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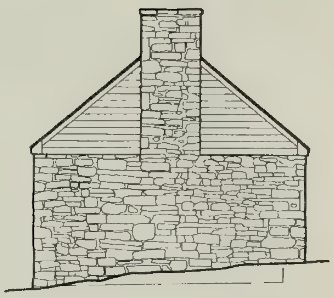

SOUTH ELEVATION
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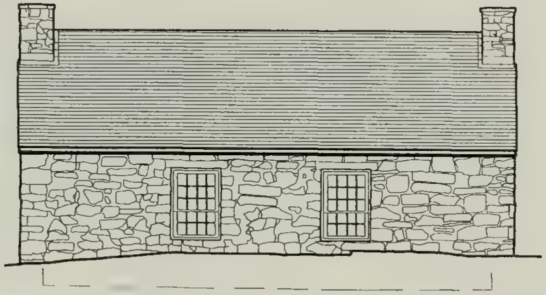

EAST ELEVATION
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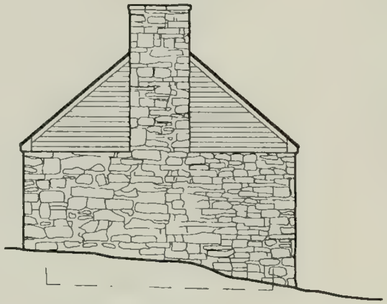

NORTH ELEVATION
SCALE 1/4" = 1'-0"
0 1 2 4 8

CONCURRED
ASSOCIATE REGIONAL DIRECTOR DATE
APPROVED
REGIONAL DIRECTOR DATE

RECOMMENDED
SUPERINTENDENT DATE
CHIEF CULTURAL RESOURCES MANAGEMENT DATE

DESIGNED
DRAWN
L M JOHNSON
TECH REV
A R OBRIGHT
DATE
JUNE 30 1994

SHEET TITLE
DESIGN DEVELOPMENT
FLOOR PLANS & ELEVATIONS
STONE BUILDING (HS-2)
ULYSSES S. GRANT NHS
ST. LOUIS, MO

AUTOCAD FILE
S80DPFEL
SUB SHEET

DRAWING NO
337/80004
SHEET 1
OF 1

DIVISION IV - BARN (HS-3)

INTRODUCTION

The Barn is the only existing structure known to have been constructed under orders from Ulysses S. Grant in the late 1860s. While most of the site structures had served for the purpose of operating a farm, this structure was built strictly to stable Grant's horses which he purchased and received as gifts during his presidency. Wings were added to the structure soon after initial construction of the three bay wide, eleven bent portion. The Barn remained virtually intact until just after 1940 when its wing additions, six dormers, the floor system, and all remaining livestock stalls were demolished. In 1962 the Barn was moved to its present location with the intent of providing additional land space for development of an adjacent housing sub-division. What remained of the Barn was stabilized and maintained. An apartment was added within the Barn soon after the move to provide shelter for an on-site caretaker hired by Delbert Wenzlick. That apartment was adapted as park office space in 1991, and renovated once again in 1994 for use as a temporary visitor center and interpretive office. The Barn continues to provide space for maintenance functions and general storage.

PART 1: DEVELOPMENTAL HISTORY

HISTORIC PHOTOGRAPHS AND ILLUSTRATIONS

The following section of photographs and illustrations are referred to throughout the Barn historic structure report. An additional photograph has been located in a 1928 newspaper account of the site, but the poor graphic quality prevents clear reproduction in this document. The newspaper photograph also does not shed much more light on the history or construction of the Barn than what is already known.[1] Other reproductions of pre-1940 photographs of the Barn have been located in the Davis family collections. Unfortunately, the original photographs have not been located and the photocopied reproductions are too crude to present in this report. Therefore, the Davis photographs will be described as best as possible in this report, with the hope that the original photographs can be located one day.

An extensive set of stereo-optic slides was taken by the Wenzlicks of the barn moving operation which took place in 1962. While the slides are important in providing visual documentation of the process (and three-dimensional at that!), the slides provided little additional information on the history of the structure. However, the slides do show the extent of the historic materials that were demolished in the process of the move. Thus, one image of the set has been included in this report. Copies of the original slides are in the park collections.

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[1] "The Home in which Gen. Grant Courted and Lived is Still a Staunch Structure," (*The St. Louis Globe-Democrat Magazine*, 4 November, 1928), 4. The image of the Barn is very similar to the view seen in Figure 4.3.

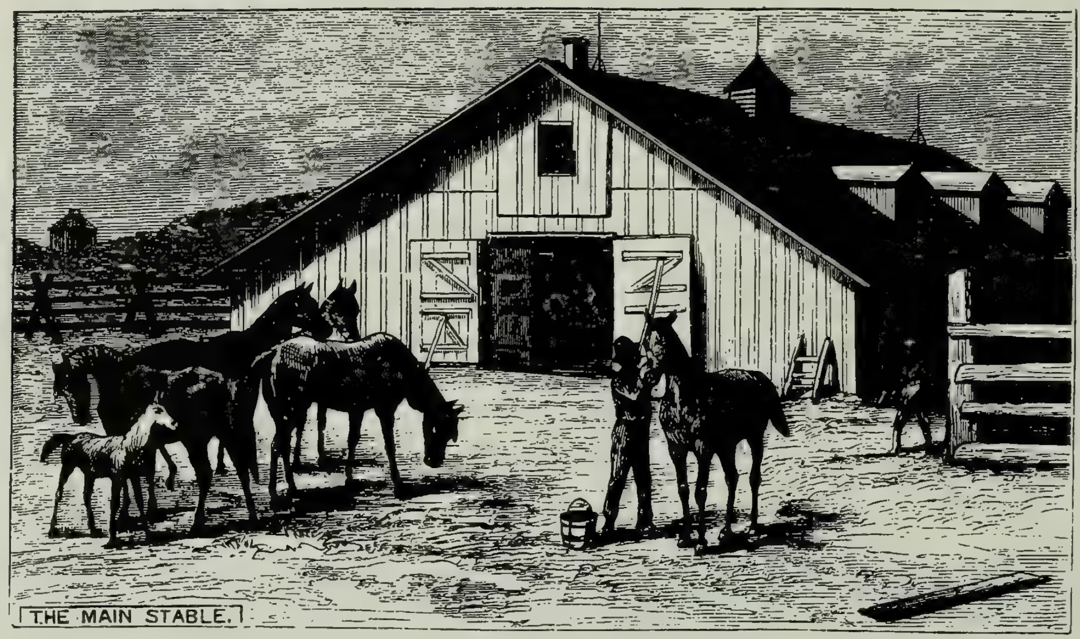
THE MAIN STABLE.

Figure 4.1 - "Missouri-President Grant's Farm Near St. Louis." View of the Barn from the northeast. (Enlarged detail of an engraving from a sketch by William Staengel, *Frank Leslie's Illustrated Newspaper*, (October 16, 1875), 93, ULSG collections).

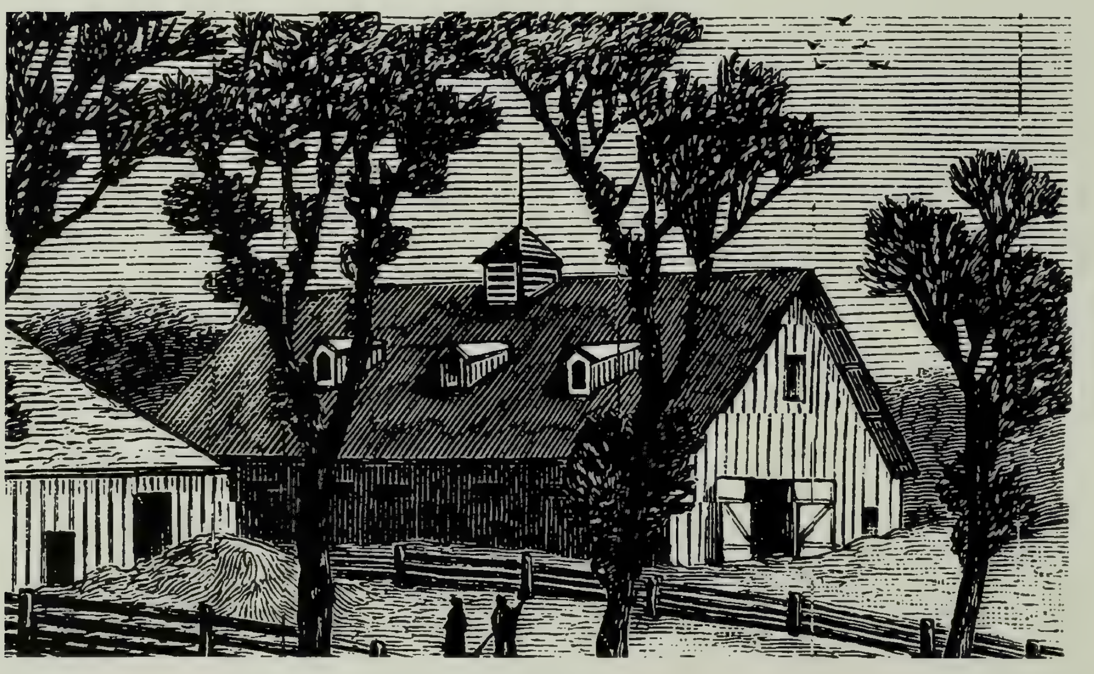

Figure 4.2 - "Missouri-President Grant's Farm Near St. Louis." View of the Barn from the northwest. (Enlarged detail of an engraving from a sketch by William Staengel, *Frank Leslie's Illustrated Newspaper*, (October 16, 1875), 93, ULSG collections).

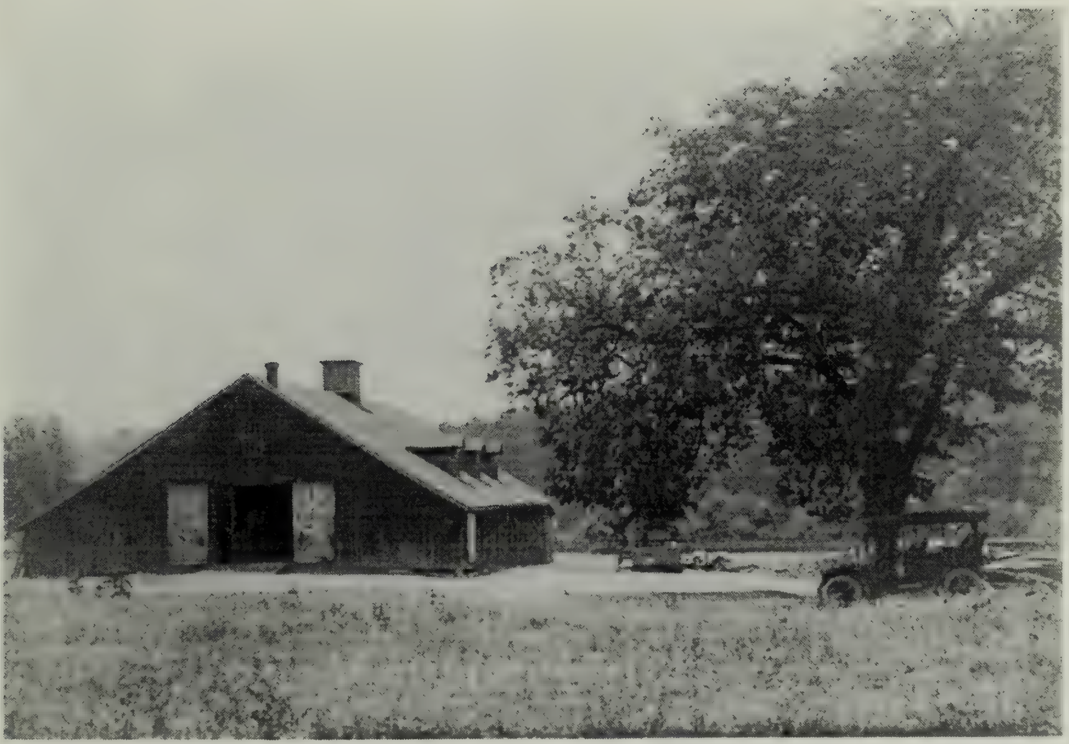

Figure 4.3 - View of the Barn from the east, circa 1930's. (Print from Bill Wenzlick collection).

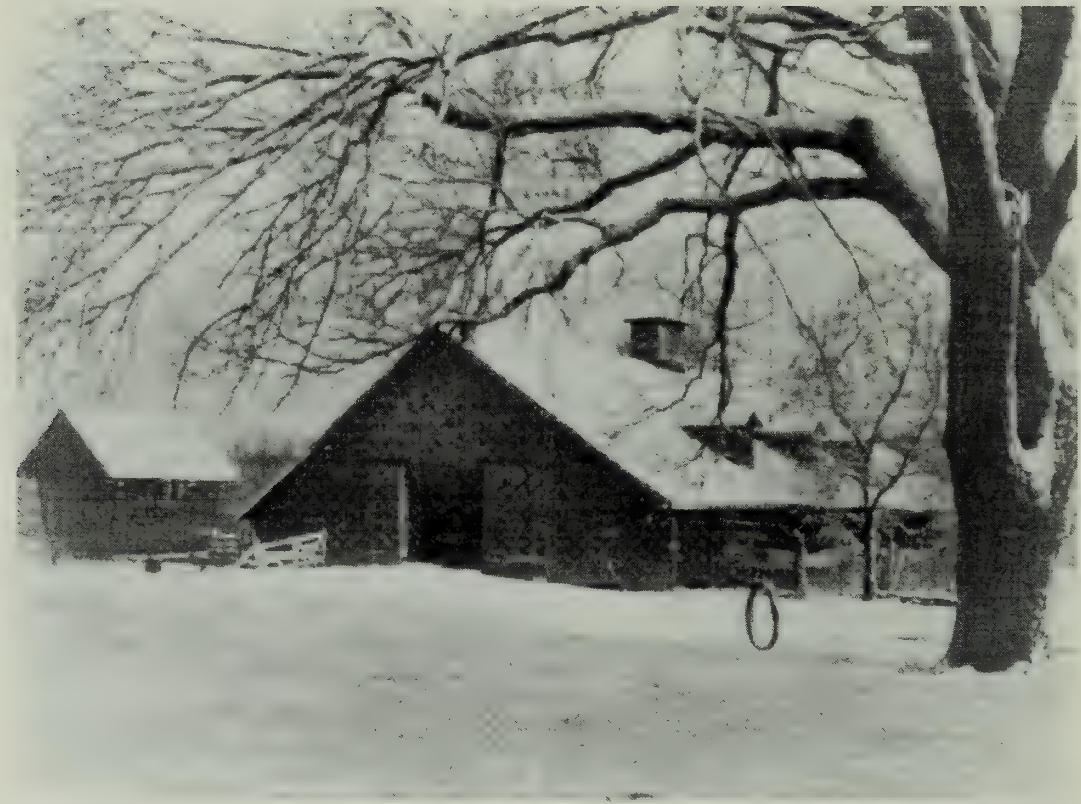

Figure 4.4 - View of the Barn from the northeast, circa 1940. This view also shows the corn crib. (Enlargement of original print from Bill Wenzlick collection. Mr. Wenzlick kept the photograph folded in his wallet while serving during World War II).

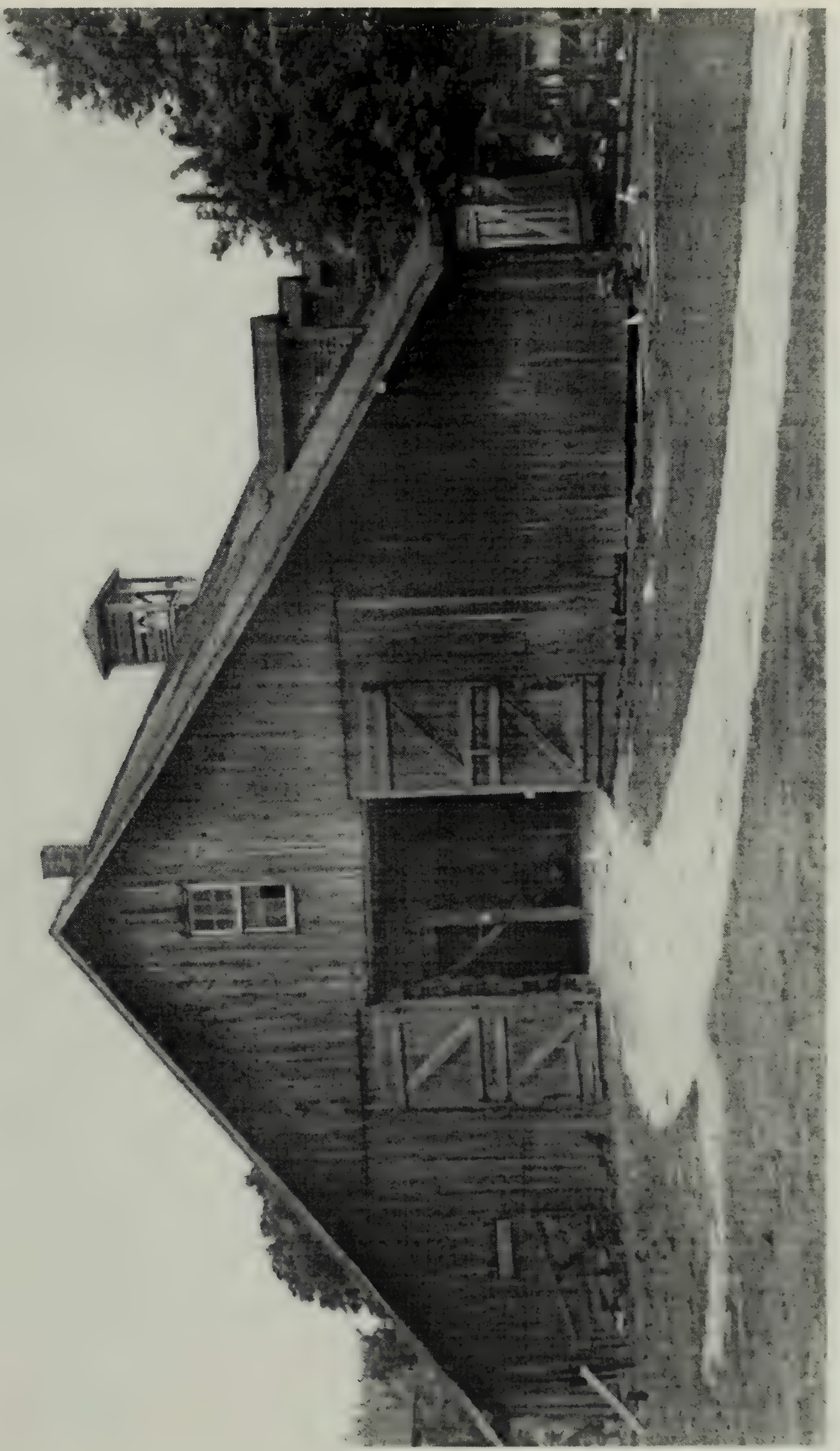

Figure 4.5 - View of the barn from the east, 27 July, 1940. Note the deteriorated condition of the cupola. (Lester Jones, photographer. Print from HABS collection, 112179-HABS MO., 95-AFT, v. 1C-1).

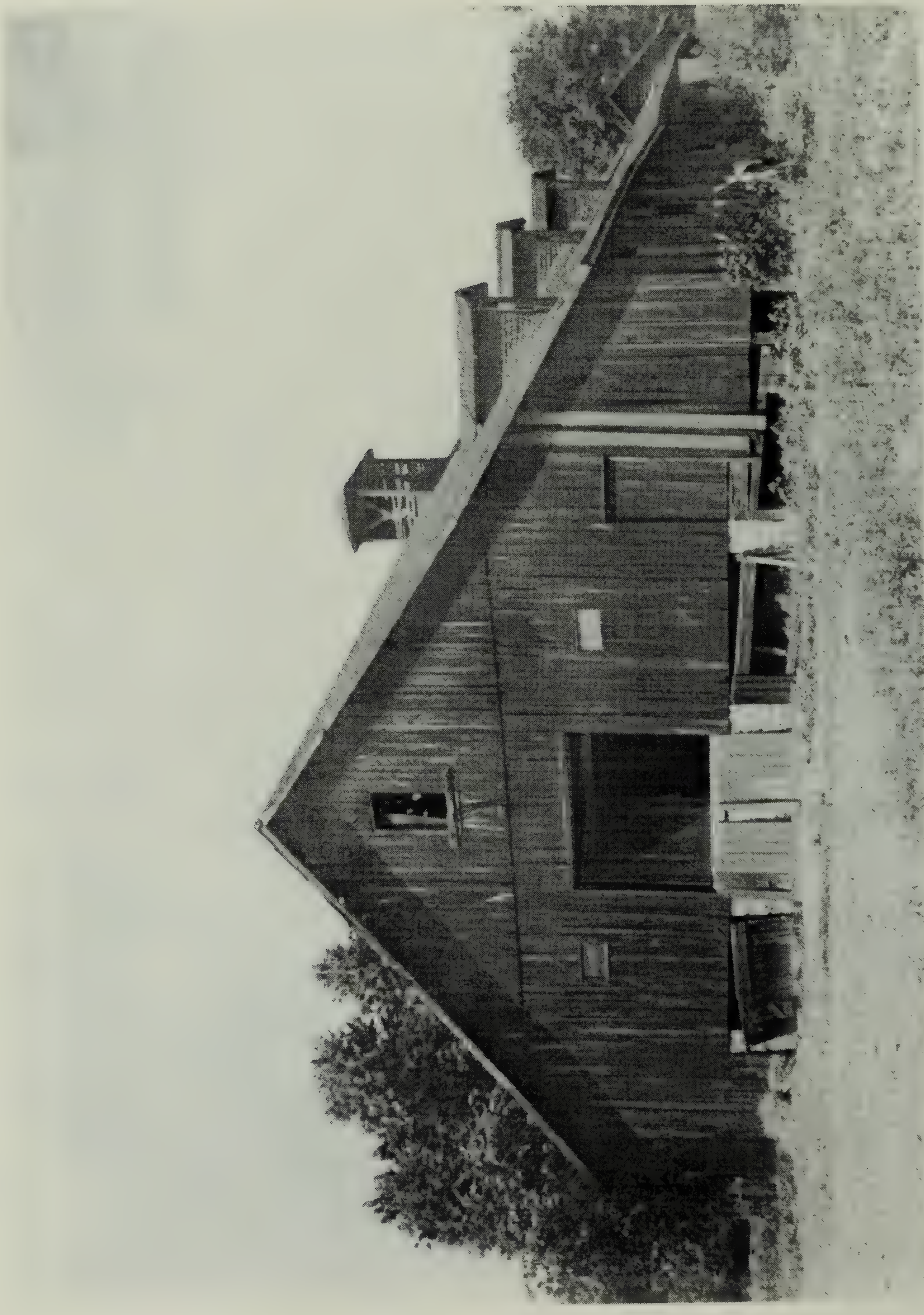

Figure 4.6 - View of the barn from the west, 27 July, 1940. (Lester Jones, photographer. Print from HABS collection, 112179-HABS MO., 95-AFT, v. 1C-2).

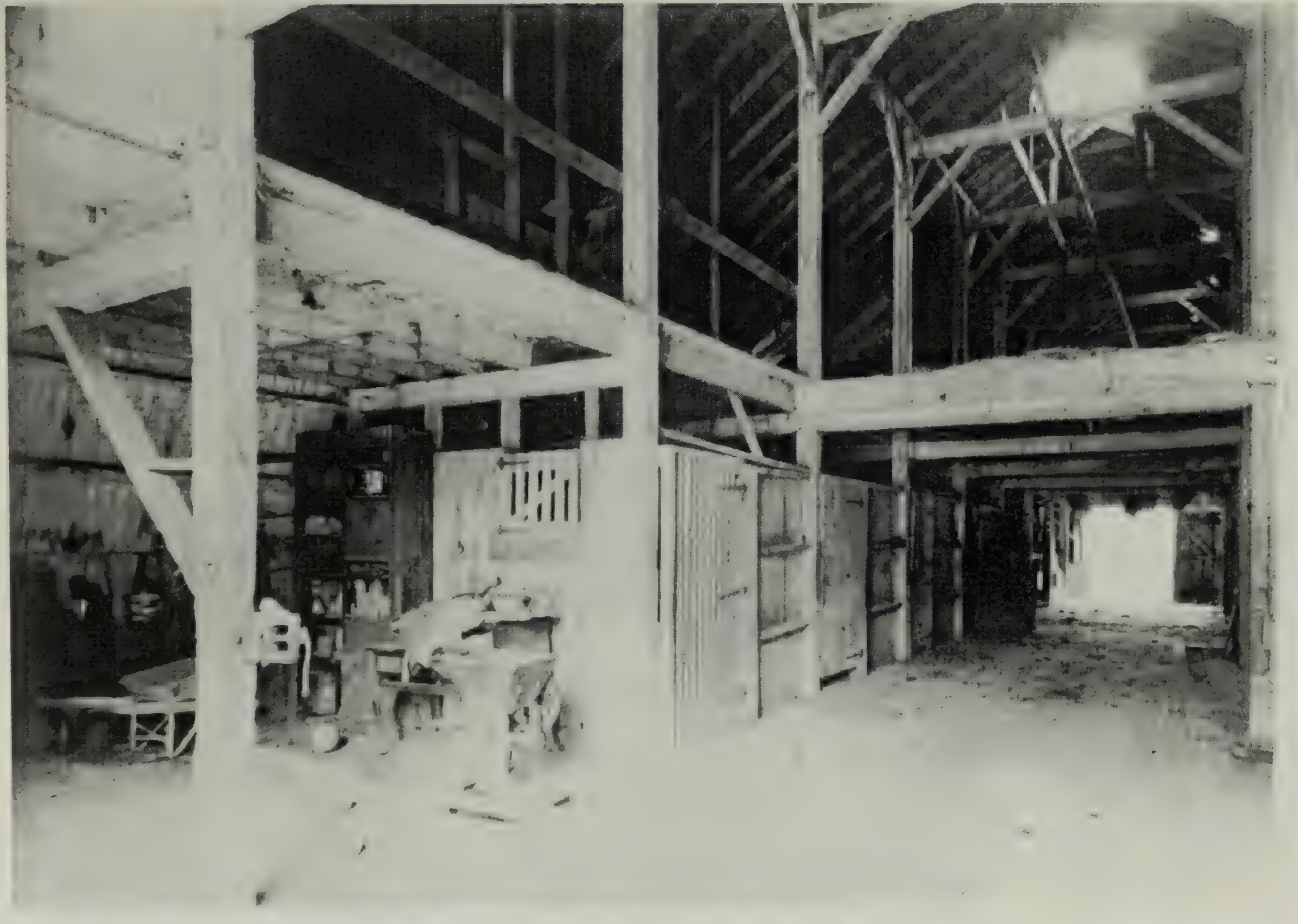

Figure 4.7 - Interior view of the barn from the ground floor level looking west, 27 July, 1940. Note the presence of box stalls in this image. (Lester Jones, photographer. Print from HABS collection, 112179-HABS MO., 95-AFT, v. 1C-3).

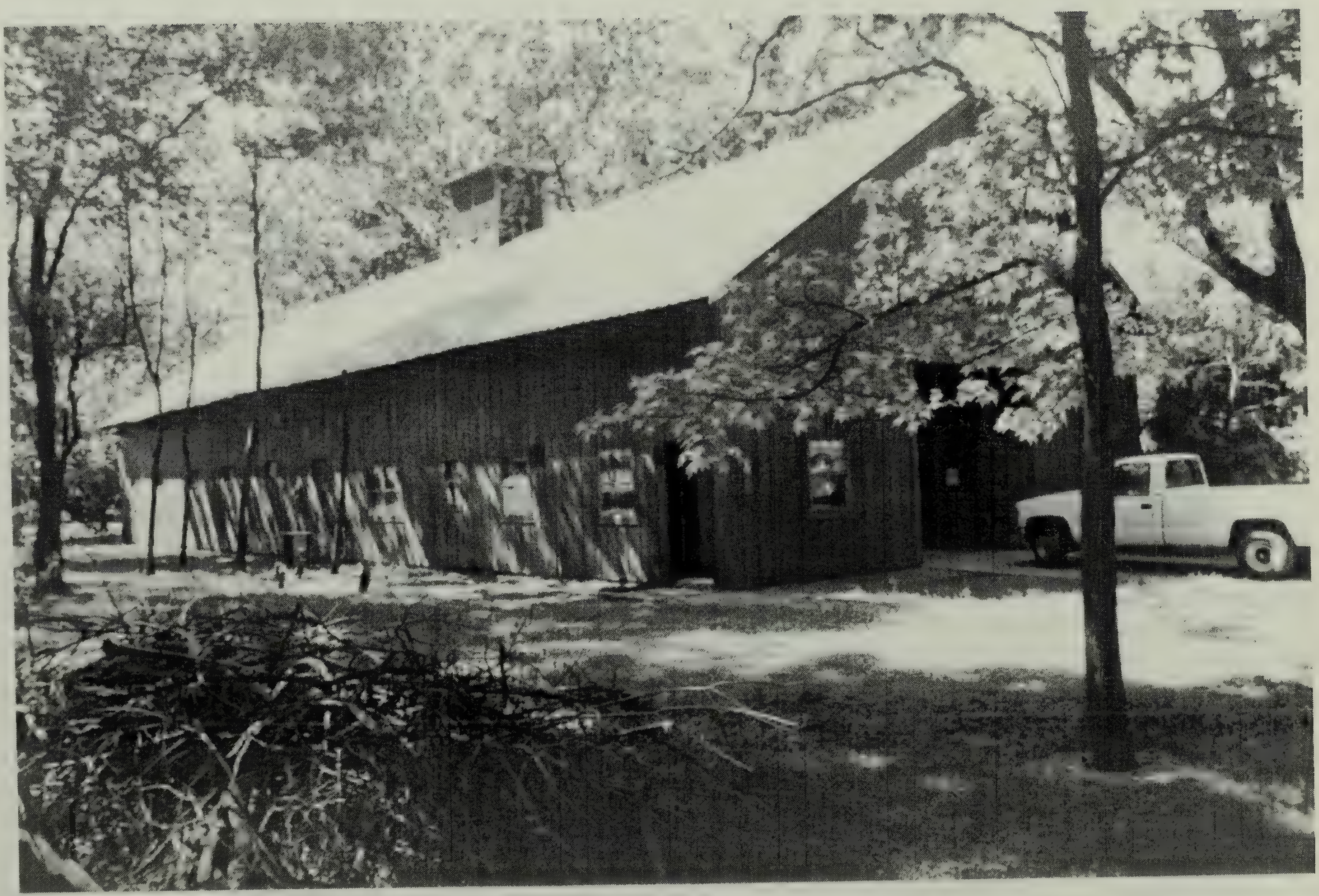

Figure 4.8 - View of the Barn from the northeast, May 1994. (Photo by the author, ULSG collections).

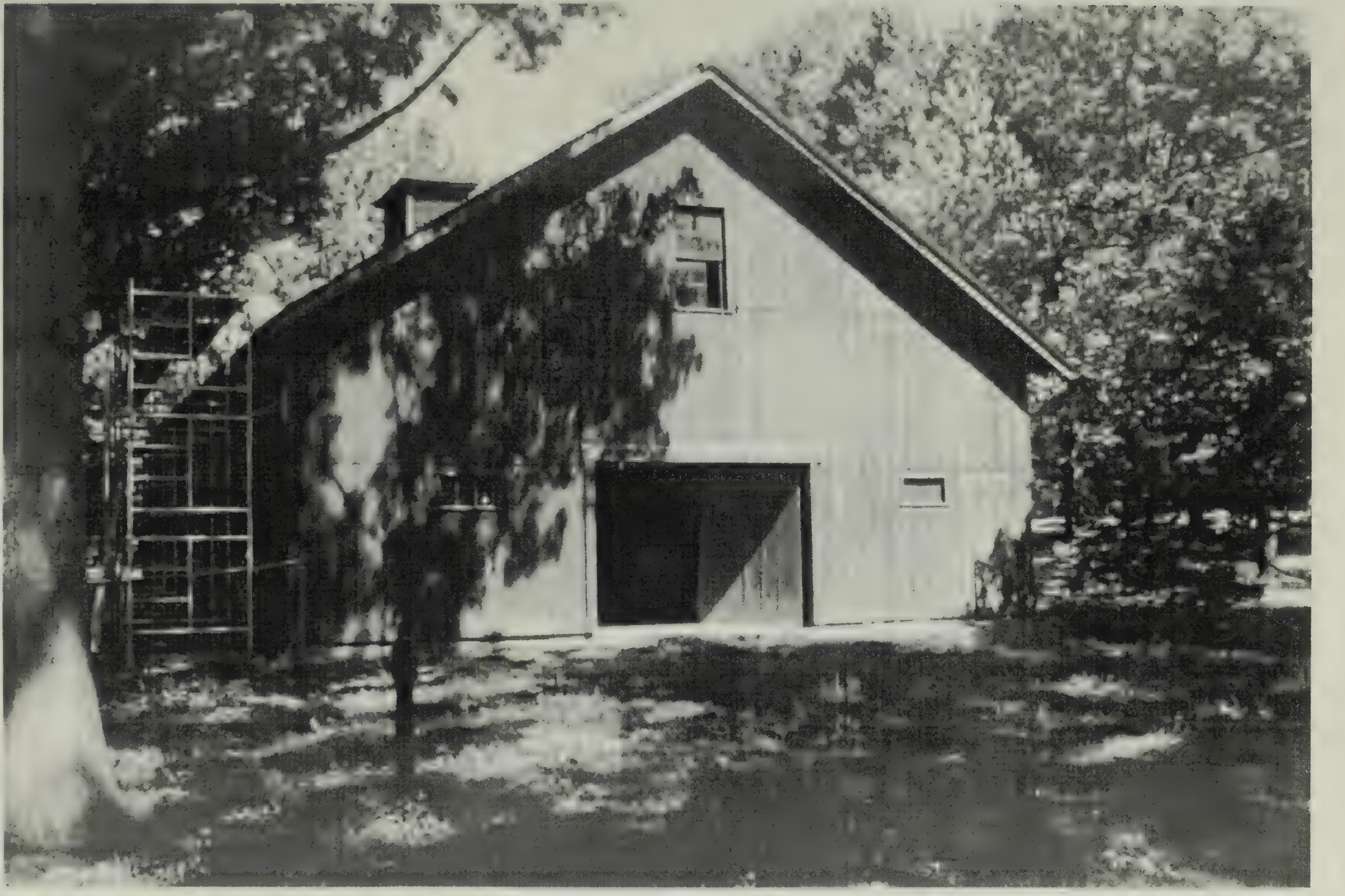

Figure 4.9 - View of the Barn from the south, May 1994. (Photo by the author, ULSG collections).

ARCHITECTURAL ANALYSIS

The Barn presently on the site was constructed in the late 1860s to stable Ulysses S. Grant's horses he shipped to the site from throughout the United States.[2] Letters from Grant to his White Haven tenant William Elrod intimate that Grant not only ordered a barn to be constructed, but may even have had a hand in the structure's design and location. The first mention of Grant's desire to construct a barn was made in a letter from Grant dated March 31, 1867, in which he writes of his intentions to construct "stabling" for new livestock.[3] Clearly, Grant had placed construction of a barn as a high priority early in his ownership of the property, and developed strategies for managing White Haven even before Elrod had a chance to settle in on the site.[4]

In a letter dated November 14, 1867, Grant shows that he has put some thought into construction of the Barn.

> I will not have a barn built until I go out and locate it and give the plans. I want a good one and with accomodations for quite a number of horses and other stock.[5]

Grant continues in the same letter that he hopes to visit White Haven in Spring 1868 to "...start every thing." Grant was apparently anxious to learn of progress on the barn's construction as indicated in letters written later that same year.[6] From Grant's correspondence it appears that construction of the barn had begun in 1868, and may have been completed that same year or most certainly by 1869.

Not surprisingly, the existing barn is very similar to military stable barn designs of the mid to late nineteenth century.[7] Grant's familiarity and experiences with military stables, and the possibility that he may have had access to stock drawings, cannot be overlooked. He may have used his experiences and/or borrowed plans to design his own stable. However, there is yet no documentary evidence supporting this theory.

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[2] Esley Hamilton, "National Register of Historic Places Inventory - Nomination Form (White Haven landmark nomination)." Washington D.C.: U.S. Department of the Interior, October 1985, Item 7, p. 5.

[3] USG, *Papers*, USG letter to WE, 31 March, 1867, 17:94. "In the course of next year I hope to be able to put up good stabling on the place you will occupy and to commence the raising of good stock."

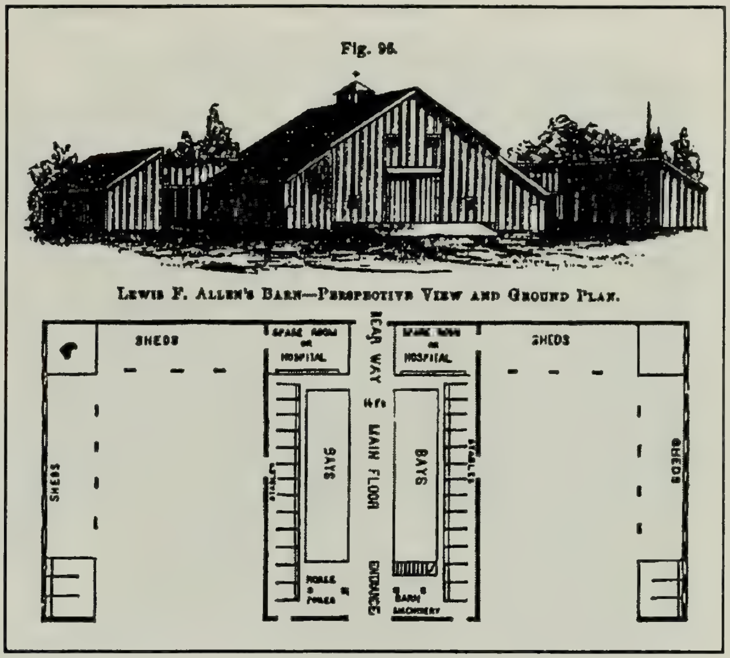
[4] USG, *Papers*, USG letter to WE, 31 March, 1867, 17:43. "You need not go out until I write to you to start. That will not be earlyer than March sone time." Simon, *Papers*, letter from USG to Elrod, 2 October, 1867, 18:7. "Except for buiding a barn...I do not want to lay out any money than what comes off the place."

[5] USG, *Papers*, USG letter to WE, 18:33. The letter also mentions what is believed to be the construction of what is now Grant Road.

[6] Fisher, *Grant's Letters*, USG letter to WE, 24 August, 1868, 31, "What progress has been made o the barn, &c." USG letter to WE, 4 September, 1868; "You can build your barn and the fence I told you about..." Fisher notes that the present barn is the one constructed during the Elrod tenancy through reminiscences of Elrod's daughters. "A large barn which stands today at White Haven originally had 22 box stalls, apparently for Grant's horses."

[7] *Design of a Stable for 70 Horses At Fort Levenworth, M.O.*, and *General Plan of Depot Stables*, Barn drawing collection, Fort Scott National Historic Site, Fort Scott, Kansas. The designs presented on these two drawings are very close in appearance and structural layout in comparison to the White Haven barn. The drawings are undated but believed to have been completed during the 1870s.

Figure 4.10 - "Lewis F. Allen's Barn-Perspective View and Ground Plan." An example very similar to the Grant barn. (Reprinted from D. H. Jacques. *The House: A Manual of Rural Architecture*, (New York: Geo. E. & F.W. Woodward, 1866), 131).



The Grant-ordered barn was originally constructed near what is now a cul-de-sac at the western end of Fernald Drive. The Barn was moved to its present location in 1962 by the Wenzlicks to provide more space for construction of another house within an adjacent housing development (see Division VII for information concerning other barns on the property). The center portion of the Barn was longitudinally oriented east to west and supported on a heavy timber structure laid on stone piers (Figure 4.6). Because of the sloping terrain, the stable floor at the east elevation was flush with the grade (Figure 4.5) but the floor level at the west elevation was raised about 5 feet above the ground.

The Barn was originally built three bays wide, with a center isle flanked by stables at each side. However, wings were added to the north and south elevations extending the width of the Barn by two bays. Six large dormers were added at the time, or soon after, the wings were constructed as the dormers shared space on the roofs of both the central portion and wings of the Barn.[8] The wings and dormers must have been added soon after the initial construction of the Barn as the wings were in existence as early as 1875 (Figures 4.1 and 4.2) and remained in place until their demolition just after 1940.[9] Grant's correspondence to Elrod fixes 1871 as the most likely year for construction of the Barn wings, although the letter is unspecific about where more stable space was to be built.[10]

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[8] James and Charles A. Davis to the author, 18 March, 1993. The dormers could be seen and accessed from the loft.

[9] Bill Wenzlick to the author, 13 October, 1992. These were removed just after completion of house renovation work because they were too deteriorated to save.

[10] Fisher, *Grant's Letters*, USG letter to WE, 28 February, 1871, 35. "...make arrangements for building more stable room..." Grant previously ordered Elrod to construct another barn. If that barn was constructed north of the Main House, or if Grant decided later against building another barn is unknown. Fisher, *Grant's Letters*, USG letter to WE, 24 November, 1870, 34. See also Division VII - Hay Barn and Stable.

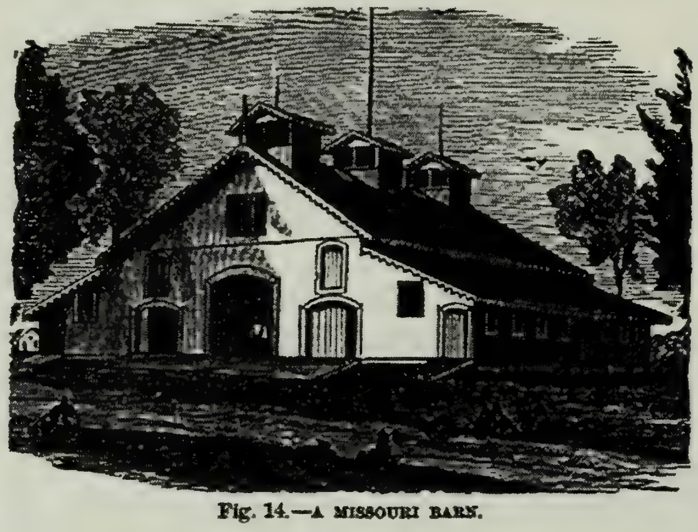

Fig. 14.—A MISSOURI BARN.

Figure 4.11 - "A Missouri Barn." Engraving of a barn similar in appearance to the Grant-ordered barn. (Reprinted from *Barn Plans and Out-Buildings,* (New York: Orange Judd Company, 1901), 28).

Photographs taken in 1940 confirm that the wings were supported by wooden piers unlike the stone piers of the body of the Barn (Figure 4.6). Other evidence supporting the belief that the wings were constructed at a later date include the use of wider cladding on the wings, and butt joints in the rake fascia where wings join the Barn. Reverse perspective analysis of 1940 HABS photographs indicates that the wings were about 12½ feet wide at each side, making the former width of the Barn at about 65 feet. There was a series of doors and windows along the eave elevation of each wing.[11] These doors may have afforded direct access for animals to stalls from the exterior. In a photograph taken in 1940, the wing windows follow the lay of the grade and are not parallel with the eave line (Figure 4.3). This indicates that the floors in the wings were probably soil and not of raised wood framing as with the center portion of the Barn.

A comparative example of this style of construction can be found in an engraving published in 1866 (Figure 4.10). In that example the general appearance, layout, cupola, and wings are very similar to the Grant-ordered barn. Wing floor levels were 3 feet lower than the central portion of the Barn in the example that "...will allow a cellar under it, if desired-or a deeper extension of the bays-and it allows storage lofts over the cattle."[12] It is doubtful that a cellar existed beneath the Grant barn. Because of the sloped site, a three foot change in level between the wings and Barn could not be attained without digging in to the grade at the east elevation. Bill Wenzlick recalled that the south wing floor level was between 1 foot and 1½ feet below the central Barn floor level prior to World

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[11] Charlie Davis to the author, 15 September, 1993. These doors can also be seen in two photographs of the Barn in the Davis family photo collection.

[12] D.H. Jacques, *The House: A Manual of Rural Architecture* (New York: Geo. E. & F.W. Woodward, 1866), 130 (hereafter cited as Jacques, *The House*).

Louden Cross Draft Hay Carrier—Continued

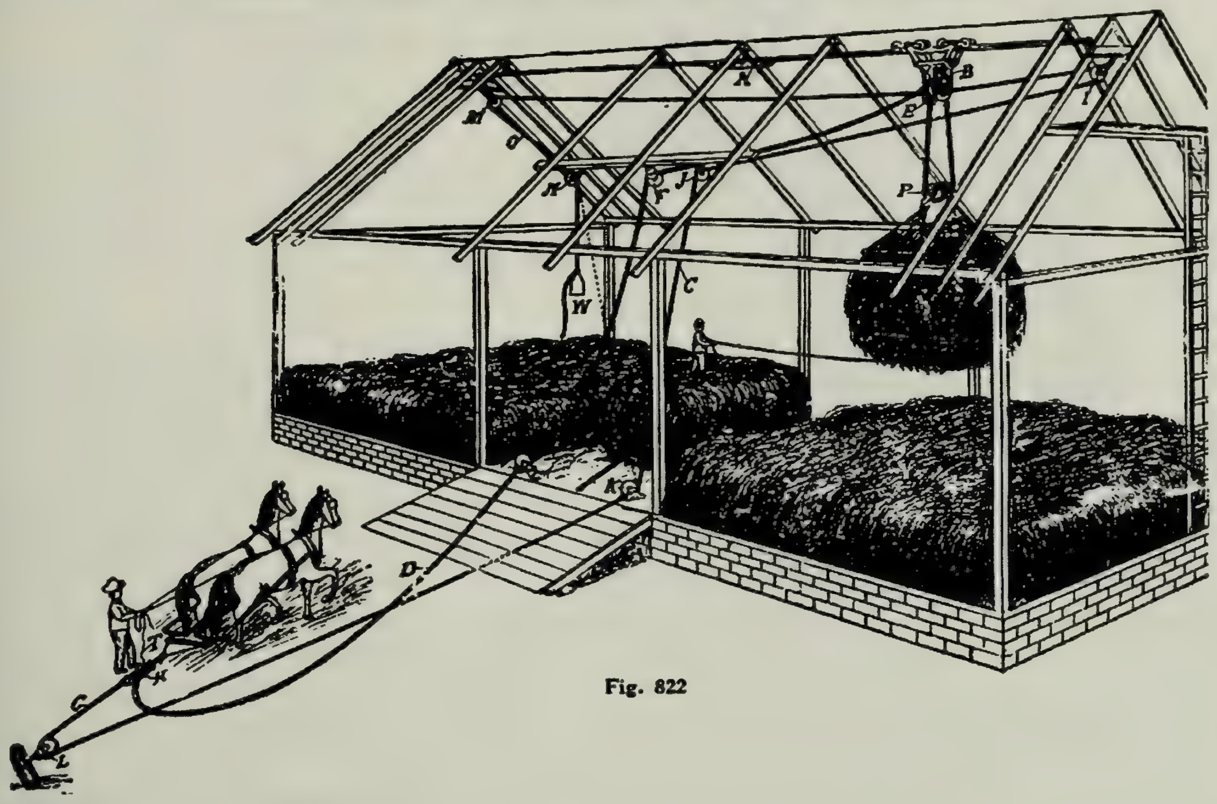

Fig. 822

Figure 4.12 - "Louden Cross Draft Hay Carrier." This illustration shows a horse-drawn operation for loading hay through a side door, while hay was transferred through the gable-end doors on the Grant-orderd barn. (Reprinted from *Louden General Catalog No. 44*, (Fairfield, Iowa: Louden Machinery Company, 1916), 21).

War II, but the floor surfaces were concrete to stable cows.[13] It is unknown if the floor level in that wing had been lowered to accommodate cows.

The roof level between the wings and the central barn are interrupted in the example, whereas the Grant barn roof leafs extended over the wings in one continuous plane. It is believed that the Grant barn wings were constructed to stable additional horses or cows.[14] The wings were segregated from the central body of the Barn, except for doors at each stall and at each gable end because the vertical board siding remained in place (Figure 4.7).

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[13] Bill Wenzlick to the author, 13 October, 1992.

[14] Bill Wenzlick to the author, 13 October, 1992. While the south wing was used to stanchion about 30 cows, most of the original box stables still existed in the west wing during the 1930s.

The Grant barn and the previous example are also comparable to an illustration of a "Missouri Barn" seen in Figure 4.11, although this example is more decorative. In the plan, stalls are asymmetrically laid out for both cattle and horses with respect to the long axis of the barn.

The existence of a wooden track supported at loft beams and running the entire length of the Barn confirms that some form of hay carrier system was employed to bulk transfer hay or straw to the loft through the hoist ways as "...the pitching up of the hay into the upper part of the bays is a very laborious process and requires considerable time."[15] An account of the circa 1930s process of moving hay into the loft of this barn was developed from the interviews of three former caretakers.

A team of horses was stationed outside the west doors, hitched to a rope that was strung through a system of pulleys. The hay fork was suspended from an iron carrier which rolled along the wooden track. A wagon laden with hay was brought in through the east door and parked beneath one of two loft openings. One of two types of hay forks were lowered and worked into the hay mound by one person who then shouted instructions to the team of horses driver. Once raised to the loft level, the load was transferred through the center of the Barn to the desired location. A person in the loft pulled a rope which released the fork's grip on the hay. Instructions were shouted to the driver to lower the fork back to its original position over the wagon, and the process was repeated.[16] An illustration of a hay rope and track system similar to what existed in the Grant barn is shown in Figure 4.12, although the Grant barn system was operated from the gable-end doors and not side doors as indicated in the illustration.

One of the hay fork carriers is believed to be similar to that shown in Figure 4.13. An image of a hay fork can be seen suspended from the track just below the cupola in the 1940 HABS photograph of the interior although the image is too blurred to reveal details (Figure 4.7). However, a double harpoon type fork was probably used into the 1930s.[17]

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[15] *Jacques, The House*, 142. Jacques goes on to describe an "elevator" or a primitive conveyor belt made of an inclined board and an endless chain that transfers threshed hay to the loft for distribution. It is doubtful that the Grant barn used this technique given the existence of the loft track.

[16] Bill Wenzlick to the author, 13 October, 1992, and James and Charles A. Davis to the author, 18 March, 1993. Wenzlick recalled that the hay forks were large enough to lift an entire load from a wagon. The Davis's recalled the use of two hay fork types.

[17] *Louden General Catalog No. 44* (Fairfield, Iowa: Louden Machinery Company, 1916), 36. "Harris Double Harpoon Fork." Charles A. Davis found and donated a double harpoon hay fork to the park which he claims is identical to one which he and his brothers used in the Barn.

Figure 4.13 - "Louden Junior Hay Fork Carrier for Wood Track." This type of carrier traveled along the Grant barn wooden track. (Reprinted from *Louden General Catalog No. 44*, (Fairfield, Iowa: Louden Machinery Company, 1916), 12).

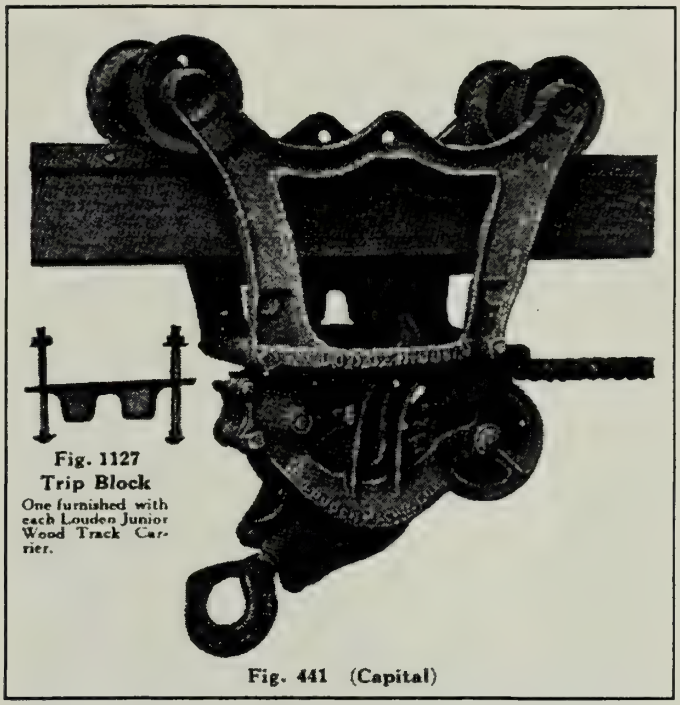
Fig. 1127
Trip Block
One furnished with each Louden Junior Wood Track Carrier.
Fig. 441 (Capital)

Once transferred to the loft, hay was supplied to horse stalls at the stable level through wood lined chutes. Figure 4.7 shows that vertical planks were fastened to three two-by-fours along the stable wall at the ground floor. The planks were canted so hay could be funneled down to the stalls against the wall to hay racks or mangers. The top of the chutes were flush with loft floor and a portion of that system may still exist between the existing loft floor and office dropped ceiling. Rough horizontal boards fastened to studs, which were fastened to the rafters, can be seen in the loft in Figure 4.7 and may have functioned as bins for the chutes. In the existing barn, vertical boards are fastened between two structural bays at the east wall in the northeast corner. The boards may be remnants of the chute system.[18]

In Figure 4.7, the horse box stalls are arranged one per bay, giving each stall an area of about 10 feet by 13 feet, or well over twice the space typically provided for horses.[19] Stalls in the central portion of the Barn were constructed of vertical boards, and the doors of vertical wooden slats each hung with three strap hinges (Figure 4.7). At the back and to the right of each stall was a short, narrow door which led to the wing space. A set of stair treads was placed at each door within the wing from the stall floor level to the wing floor level. The stairs were placed at an angle in the stall corner, and there was an angled feed box in the stall corner along the door wall.[20]

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[18] Bill Wenzlick to the author, 13 October, 1992. The chutes may have been left in place as there was no reason to remove them.

[19] *Barn Plans and Out-Buildings* (New York: Orange Judd Company, 1901), 23-24 (hereafter cited as *Barn Plans and Out-Buildings*). In two example stall widths are given as 4½ feet and 5 feet, and the depth in one example is 9 feet.

There were other spaces at the stable level, including the wings, but there is little or no physical evidence remaining for them. However, oral accounts give some indication about usage of the space.

In the south wing, beginning at the east elevation, a concrete slab floor and steel cow stanchions were installed by Albert Wenzlick.[21] The concrete floor extended about 40 feet to 50 feet west from the east wall. West of the concrete floor was a calving box stall which measured between 10 feet to 12 feet square, and then two mule stalls. The remainder of the space was open.

At the north wing, beginning at the east end, there was an open space with a door at the north wall. West of the open space were a well pump, electric generator, and battery bank. Stalls may have been removed from this area to install the equipment. The generator and engine were bolted to a concrete slab floor. Box stalls were lined up against the south wall almost to the east end of the wing.

There was a two hole privy in the northwest corner against the north wall.[22] Exterior vertical siding continues to the ground in that corner in Figure 4.6, confirming that a privy may have been in that location. Perhaps the extended siding served as a modesty skirt. In Figure 4.3 there is an image of what appears to have been a small, shed roof addition on the west side of the Barn. What the addition would have been used for is unknown, and there is yet no further documentation or physical evidence on the addition. Perhaps the addition enclosed the privy.

At the southeast corner, in the south bay of the central portion, a stair led directly to the loft stable jack room. A portion of the stair stringers and a riser board was found at the underside of the loft floor during 1994 demolition work on the park office space. Beneath the stair was an enclosed closet, and adjacent to the base of the stair was a door opening to the south wing.[23] There was open space immediately west of the stair, then a large stallion stall constructed of vertical two-by-fours. West of the stallion stall were some box stalls and then open space. A horse powered tread mill was

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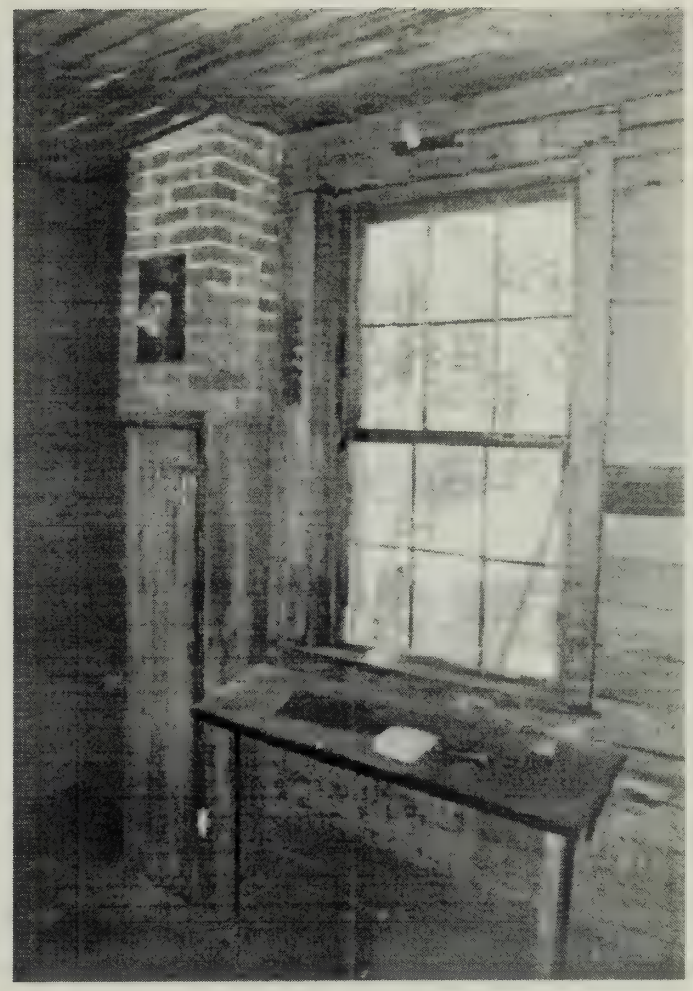
[20] Bill Wenzlick to ULSG Chief of Maintenance Michael Ward, 21 April, 1994. Beams installed to lift the Barn in 1962 were needled through these door openings according to Wenzlick. A series of stereo-optic slides taken during the move show uniformly sized and spaced openings along the former south and north elevations. None of the doors are presently in place but two board doors nailed to the loft floor may have come from the elevation openings. Bill Wenzlick to the author, 3 May, 1994. Wenzlick provided a sketch of the stair and feed box arrangement in each stall.

[21] James Davis to the author, 18 March, 1993. Davis indicated that farmers around the area were envious of the new steel stanchions, as they were only familiar with stanchions constructed of wood.

[22] Bill Wenzlick to the author, 13 October, 1992, and James and Charles A. Davis to the author 18 March, 1993. Wenzlick recalled that there was no pit or lined hole for the privy beneath the seats.

[23] Bill Wenzlick to the author, 13 October, 1992. The closet was used to store "junk" for which no one could find any other place.

Figure 4.14 - View of the loft room, May 1994. The chimney is supported by wood framing enclosed as a cabinet. (Photo by the author, ULSG collections).



stored in this open space.[24] During the nineteenth century, the treadmill may have been used to grind feed, such as cracked corn and bran, and to exercise horses during Albert Wenzlick's ownership.[25]

At the east end of the north bay an open area was used as a tack and/or tool room. Saddle brackets and harness pegs were on one of the walls. At the west side of the space sat a feed box that was filled from a hole in the loft floor. Paint marks and nails confirming the location of the original feeder system were found during demolition of the park office ceiling in 1994. The remainder of the space was open in the 1930s but physical evidence indicates that box stalls may have lined the entire north wall.

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[24] Bill Wenzlick to Kristen Marolf, 10 October, 1992. Wenzlick recalled that August "Gussie" Busch had asked him about the Barn treadmill many years ago. Wenzlick also recalled that pieces of it were next to the outhouse when he lived at the site prior to World War II.

[25] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 36, and James Davis to the author, 18 March, 1993. According to Davis the treadmill was unusual in that two horses could be hitched up to it rather than the usual single horse. The treadmill had a vertical axle with a large "flywheel" wheel at the axle. An arm came out of the axle which the horses were hitched. The treadmill was also mentioned in "The Home in which Gen. Grant Courted and Lived is Still a Staunch Structure," 15, as a "...source of power for grinding corn meal and other farm purposes."

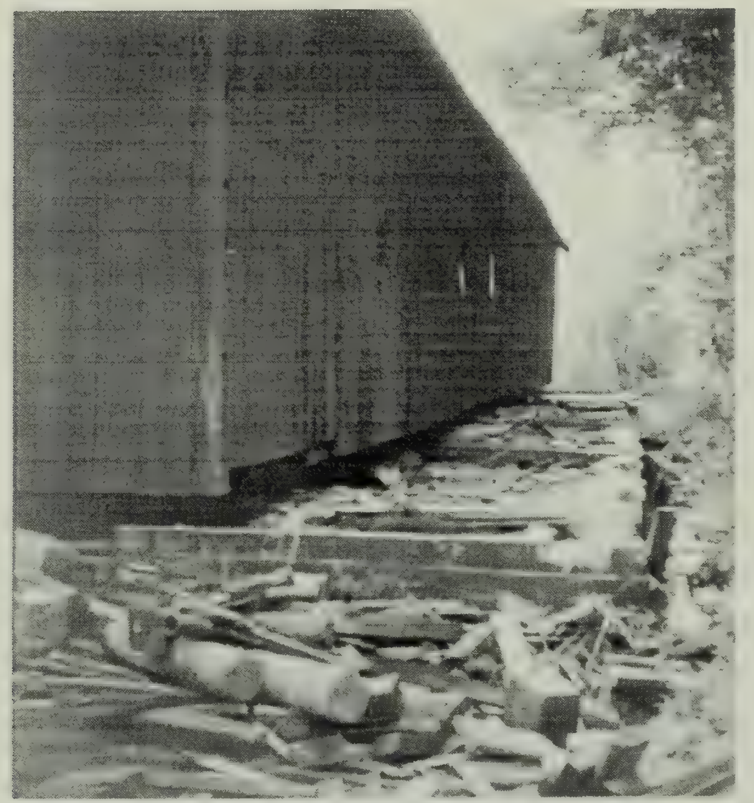

Figure 4.15 - Barn from the northeast during superstructure separation from the sub-structure, 1962. (Cropped view of color stereo-optic slide from Bill Wenzlick collection).

There is much speculation about the former function of the enclosed room at the north gable end of the loft. The space may have been used as a stable jack's quarters or as an office during the nineteenth century. Remains of a chimney stack indicates that the room was heated by a stove. The room was used to cure meat, and as a boy's clubhouse during the 1920s and 1930s.[26]

Ancillary buildings around the Barn included a corn crib at the southeast corner and a pig sty along the south elevation, each of which were demolished by 1940.[27] A hen house at the northeast corner was in use through the 1920s (Figure 4.5).[28] An existing brick lined well, located at the northwest corner of the former Barn location, furnished water for the Barn, Main House, and Cottage.

The Barn remained in its original location, serving as storage, garage, and minimal livestock space for the Wenzlicks.[29] Horse stalls were removed from time to time in response to the want of

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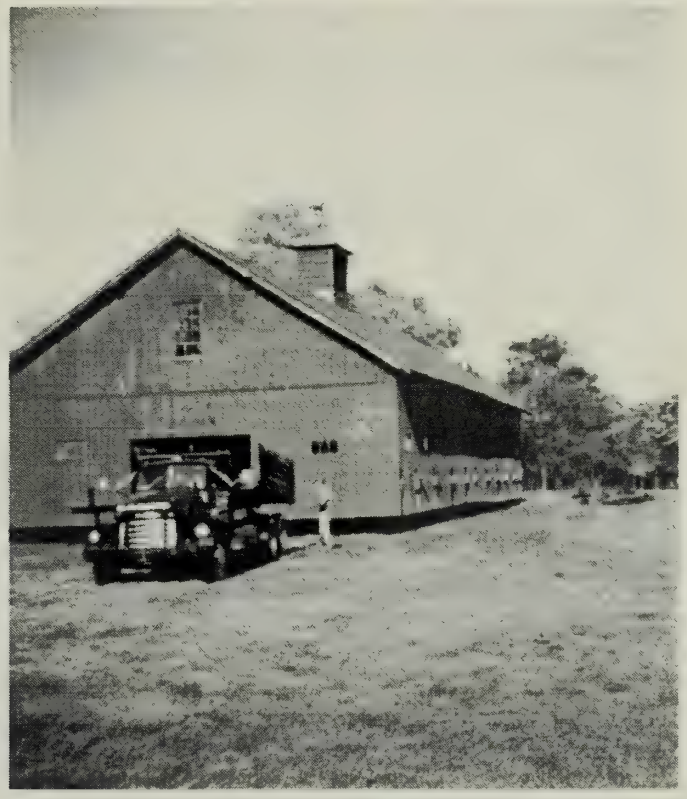
[26] Bill Wenzlick to the author, 13 October, 1992, and James Davis to the author, 18 March, 1993. Davis recalls tales of the room having been used as a stable jack's quarters during "Grant's time." Fresh slaughtered pig carcasses were hung to be "sugar cured." Graffiti in the room indicates that it was used by the "Davis Boys."

[27] James and Charles A. Davis to the author, 18 March, 1993. Pigs were raised to supply meat for the farm.

[28] The hen house was filmed during the 1920s by Albert Wenzlick.

[29] "The Home in which Gen. Grant Courted and Lived is Still a Staunch Structure," *St. Louis Globe-Democrat Magazine*, 4 November, 1928, 15. "Part of the barn is used nowadays for a garage, and part houses the family cow."

Figure 4.16 - The Barn during its move to its present location, 1962. Note the lateral beams needled through the side of the building. (Cropped view of color stereo-optic slide from Bill Wenzlick collection)



additional working and storage space.[30] A 1916 account of the Barn states that the structure was used by the Wenzlicks as a garage, electric light plant, and to stable horses and cows.[31]

The Barn was moved in 1962 so that additional land area could be secured for construction of a cul-de-sac and a house.[32] One pair of holes was drilled through each post about chest height to fasten lifting beams to the structure. Once the weight of the Barn was relieved from its original foundations, the floor structure and a portion of the lower wall engaged to the floor were sawn and separated from the superstructure (Figure 4.15). The Barn was turned 90-degrees during its transfer, and the former east elevation became what is now the north elevation (Figure 4.16).[33] The remaining Barn floor structure, flooring, and stone piers were demolished. It is unknown how much material was salvaged for use elsewhere, but a few floor beams and decking were stored in the Barn.[34] New foundations were constructed of concrete perimeter stem walls and internal piers, and the Barn was lowered onto them.

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[30] Bill Wenzlick to the author on 13 October, 1992. Delbert Wenzlick allowed the fledgling Museum of Transportation to store vehicles in the Barn until better accommodations could be had. The vehicles were stored from around 1945 into the 1950s and included a replica of Hitler's second car and a New York double decker bus that had to be moved continuously so that other vehicles could be moved in or out of the Barn.

[31] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 35. The description of the Barn is erroneous, however. The article describes the structure as being constructed "...with huge, hand-hewn oak supports, showing still the bark." The Barn is actually constructed of sawn pine. Either the article's author confused the Barn with another structure or had not gone into the Barn and fabricated portions of the article.

[32] Stereo slides taken by the Wenzlicks provide detailed three-dimensional documentation of the Barn move process. Copies of the slides are in ULSG collections.

[33] Bill Wenzlick to the author, 13 October, 1992. The Barn was moved by E.F. David Moving Co. for $7,800. David had not previously moved a building the size of the Barn, but was willing to accept the job to try out new hydraulic lifting equipment he had acquired.

Within one year of completion of the move, the damaged boards were removed and replaced with boards salvaged from other structures, and ¾ inch plywood with faux battens was installed to cover the vertical siding.[35] A rough concrete slab floor was poured and an asphalt shingle roof installed.[36] A three room caretakers apartment was then constructed in the interior of the northeast corner. The remainder of the ground and loft floor space was dedicated to storage of lumber, pipes, windows, and miscellaneous materials. Caretaker Sam Stewart occupied the apartment from 1965 until 1979. Soon after Stewart left Jeff Hobbs lived in the apartment until about 1986. When the property was purchased in 1986 by St. Louis County site caretaker Barnes "Barney" Bradshaw moved in.[37] The apartment was extensively renovated by the NPS in 1991 for office space, and again renovated in 1994 for use as office and visitor contact space.

BUILDING DESCRIPTION

Presently measuring 40 feet by 100 feet in plan, the Barn is the largest structure on the site. The eleven bent[38] structure is framed of sawn yellow pine heavy timber fastened with trenails and laid out with 10 feet by 13 feet bays. The building is topped by a gable roof ridged at 26 feet above grade, and protected with asphalt strip shingles. Rafter tails are slightly coved at the open soffit. A large cupola is centered on the roof ridge and features a weathervane. The Barn is currently clad in ¾ inch plywood with faux battens. Vertical board siding and some ground floor stable windows are concealed from exterior view behind the plywood. A large board and batten double door and double hung loft window is centered at each of the gable ends. Originally raised on stone piers with a wood plank floor, the stable floor is now a cast concrete slab. The entire ground floor is devoid of stables except for park office space and a visitor center enclosed at the east bay. The wood plank loft floor is supported by light framing members. There are two hoist way openings in the loft floor above the center isle; each of the openings is two bays long. A room slightly raised above the loft floor is located at the north gable end. The room contains the remains of a brick chimney now removed to below the roof line.

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34. Bill Wenzlick to the author, 13 October, 1992. The floor boards and maybe some of the floor joists are in the loft.

35. Bill Wenzlick informally to the author.

36. Bill Wenzlick to the author, 13 October, 1992. A former caretaker for Delbert Wenzlick, Shed Davis, suffered a heart attack while finishing the slab. He collapsed face first into the fresh concrete and died near the northeast corner of the apartment.

37. Bill Wenzlick, undated notes taken during interview with Kimberly S. Little, ULSG files, and Bill Wenzlick to the author, 8 December, 1994.

38. Thomas Corkhill, *The Complete Dictionary of Wood* (New York: Stein and Day, 1979), 38. Bent: Two or more posts or piles braced together to form a support in heavy timber construction.

MATERIALS ANALYSIS

Paint

Paint analysis was performed on several samples taken from exterior painted surfaces of the Barn in 1992 by Washington University Technical Associates (WUTA). The purpose of the analysis was to determine historic color systems. Refer to Appendix D - Paint Analysis for specific information concerning past colors.

Wood

Four wood samples were removed from structural members and siding in the Barn in 1992 and analyzed by the Forest Products Laboratory, Madison, Wisconsin. The purpose of this analysis was to determine wood groups which is important in structural loading analysis and to ensure compatible species are used in the repair of millwork. In general, all structural member samples were found to be in the yellow pine group and the vertical board siding of white pine.[39] See Appendix A - Wood Identification for specific results.

Asbestos

In 1991 the National Park Service contracted with the St. Louis firm ATC Environmental Inc. to survey the extent of asbestos bearing materials at the site. The firm identified no asbestos bearing construction materials in the Barn.

SITE CONTEXT

Grade and Drainage

The existing grade is relatively level with a slight rise to the east. A shallow swale at the east elevation near the southeast corner occasionally ponds during heavy rains. The grade at the west side of the building slopes slightly down to a shallow ditch just west of the fence line. Since the Barn has no gutters and downspouts, roof runoff has created a mild depression at the ground level below the eave line. No free water nor excessive dampness has been seen at the barn floor although the visitor center and office occasionally gets damp due to the lack of a vapor barrier beneath the concrete slab floor. The low set of the Barn, with respect to the grade, invites ground water penetration and splashback from roof runoff hitting the ground.

According to a detailed site survey prepared in 1992, the edge of a 100-year flood plain touches the northern face of the Barn (See Site Plan). During one period of heavy rain in 1991 the Prairie Spring at the northern boundary of the park briefly rose to within a few feet of the driveway. During heavy rains in 1993 creek floodwater flowed past the north barn doors by several feet.

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[39] Alden, samples W-Barn-54 through W-Barn-57.

Vegetation

There are numerous small to large trees surrounding the structure, many branches are touching the roof. Small diameter trees close to the east elevation were removed in 1994 to deter squirrels from accessing and damaging the roof and cupola (Figure 4.8). Branches of the large trees were trimmed in 1993. These trees are healthy and pose no immediate threat to the structure except for a chance lightning strike which may be directed to the Barn from a tree.

Pavement

Prior to 1994, all pavements were installed by the Wenzlicks during the 1960s. A concrete slab drive leading from the main drive to the north barn doors and a crumpling brick walk joining the main and barn drives to the visitor center door were removed and replaced with concrete by the National Park Service in 1994. A gravel-surfaced temporary parking lot adjoining the south elevation of the Barn, and a concrete walk at the east elevation linking the parking lot to the visitor center were also constructed in 1994.

FABRIC SURVEY

Foundation Systems

Prior to the Barn being moved to its present location, a heavy timber substructure was supported by stone piers. In the process of the 1962 move, the piers and substructure were detached from the structure and removed. The existing foundation consists of cast-in-place concrete perimeter stub wall and 14 inch diameter interior piers beneath each of the wooden posts. The depth of these walls and piers are between 3 feet and 4 feet below grade. The foundations were earth-cast and are reinforced with elevator cable.[40] The Barn posts were lowered onto steel pins anchored into the concrete piers.[41]

Structural Framing Systems

The Barn is of heavy timber post and beam construction, with light frame loft floor and roof systems. All timber is yellow pine. The 6 inch by 8 inch posts are spaced at 10 feet on center in the north/south direction; there are three bays in the east/west direction spaced 12 feet 8 inches in the center bay and 13 feet 4 inches at the outer bays. The loft deck is supported by widely spaced 2 inch by 10 inch joists resting upon heavy timber beams spanning between the posts. The beams are tenoned into the posts and held by trenails. Four inch by four inch knee braces project into the loft space at each post from the near the top of the wall plate to the loft floor. The 2 inch by 6 inch roof joists are set at 24 inches on center and are fastened to the beams with cut nails.

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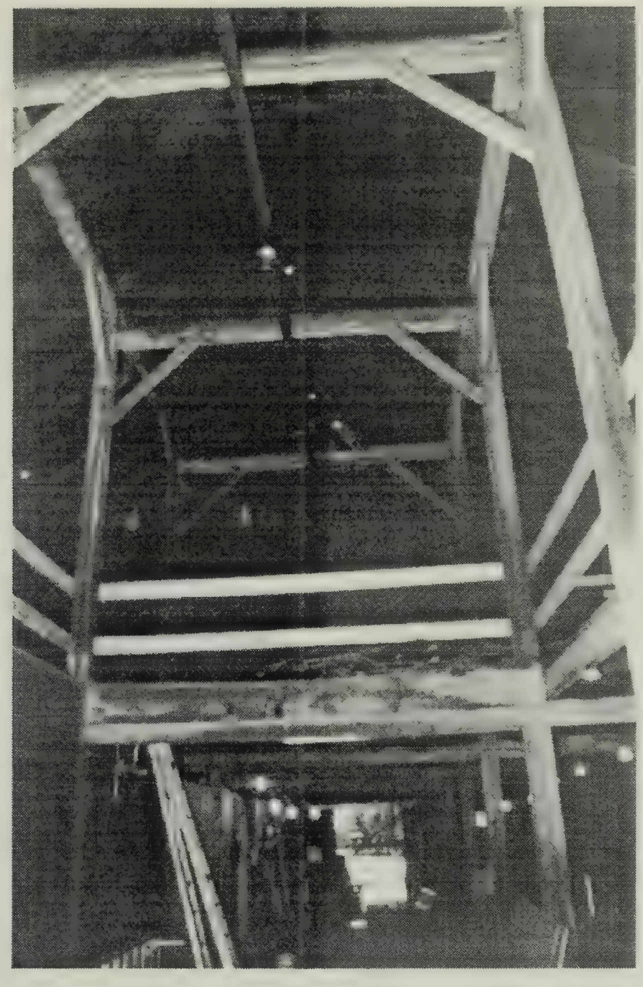
40. Bill Wenzlick to the author, 8 December, 1994. The cable was salvaged from apartment buildings owned by Delbert Wenzlick.

41. Bill Wenzlick to the author, 5 September, 1992 and 8 December, 1994. Concrete piers were poured prior to the Barn being moved. When the Barn was suspended over the new foundations, the 12 inch long steel pins were centered on the posts and anchored to the piers with an additional pour of concrete which raised the pier height. The pins extend about 4 inches into the bottom of the posts.

Figure 4.17 - Interior view of the Barn through the hay lift opening. (Photo by the author, May 1994, ULSG collections).



A structural report prepared in 1994 identified deteriorated components, and analyzed floor load capacities, and wind and seismic resistivity.[42] Overall, the existing barn structure is in fair condition. The building will perform well in heavy wind loads (70 miles per hour) and during an earthquake of moderate strength (5.0 to 6.5 on the Richter Scale) if repairs are made to deficient structural members.[43] Most structural problems resulted from a leaking roof and twentieth century alterations. Two west wall posts are in poor condition, according to the structural report. Some posts have deep splits which weaken the structure during strong winds or earthquakes. Several loft-level knee braces are missing.

While the loft framing will support a live load of 25 pounds per square foot, much of the deck is extremely deteriorated and will not support the lightest of loads. Several loft floor joists are broken or deteriorated, particularly within the west bay.

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[42] HA, *Structural*, 26-30.

[43] HA, *Structural*, 29.

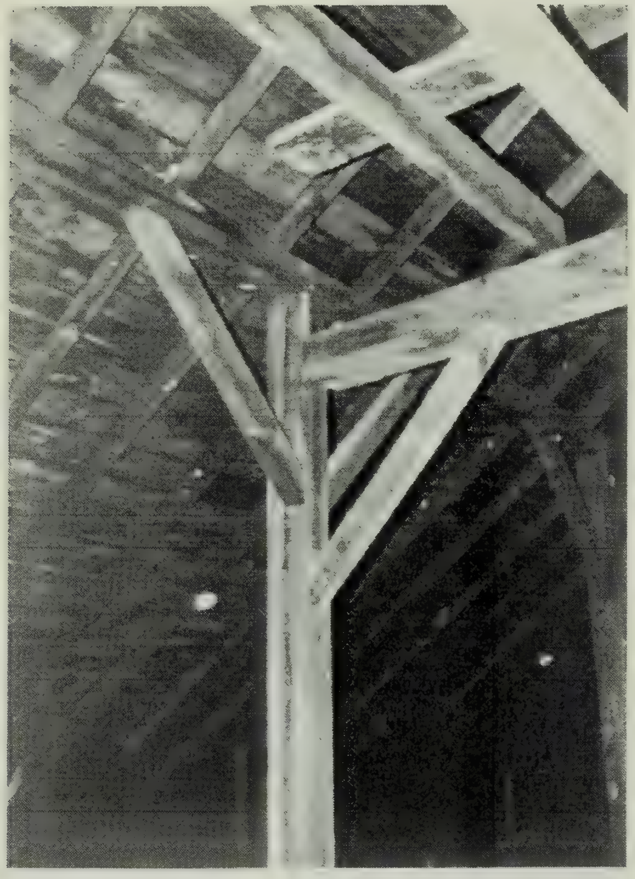

Figure 4.18 - Typical structural joining system between the interior posts and roof framing system, May 1994. (Photo by the author, ULSG collections).

Wall plates along most of the west wall and in a portion of the east wall are extremely deteriorated. All rafter tails along the west wall have been replaced with dimensioned lumber. Some of these replacement rafters in contact with the plate are also in poor condition. The east elevation rafter tails are coved at the lower surface and are believed to be historic. During 1994 reroofing work it was discovered that many of the rafters at the west roof may be deteriorated. The roof system will support a code-specified design snow load of 20 pounds per square foot if repairs are made.

Overall, the cupola framing is in fair condition. Four inch by four inch posts framing the cupola are decayed just below the louver sill level, but are in good condition for the remainder of their length.

Exterior Cladding Systems

Historically, the Barn was clad in vertical board and batten siding. At present, the Barn is clad in ¾ inch plywood with thin 1½ inch wide battens sawn from two by fours and installed soon after the Barn was set into place in 1963. The plywood is in good condition although algae growth is present at the end of plywood at the east elevation signaling the presence of moist conditions.

Beneath the plywood is a mixture of historic and salvaged random width (7 inches to 16 inches) vertical board siding measuring 1 inch thick. All battens were removed prior to installation of the plywood cladding.[44] Paint ghosts of former battens measuring about 1¼ inches wide were found at the south elevation were a section of plywood was lifted. HABS photographs from 1940 show the battens to have been simple rectangular sections with no ornamented profile (Figures 4.5 and 4.6).[45] No batten paint ghosts could be found at a small section sampled at the east elevation near the southeast corner of the building perhaps due to subsequent episodes of painting.

Some of the original siding has been cut through the installation of double hung windows when the caretakers quarters were constructed. Siding exposed at the interior is in fair to good condition. Deterioration is concentrated at the lower ends of the boards near the ground surface such as seen to the left of the doors in Figure 4.5.

Roof Systems

There is evidence that roof sheathing has been extensively replaced especially at the west roof leaf which features a variety of unspaced, random width board sheathing. The bulk of the ¾ inch thick sheathing appears to be in poor condition. During 1994 work to install a temporary metal roof, it was discovered that the west roof face sheathing is extremely deteriorated in many areas. It is unknown if any of the original sheathing remains intact.

Although there are no extant photographs, the Barn roof is believed to have been originally clad in circular sawn wood shingles. Several wood shingles were found on the ceiling structure of the stable jack room in 1993. The shingles may have dropped from between spaces in the roof sheathing when the roofing was removed and replaced around 1963. Weather ware patterns indicate that the 16 inch shingles had 4½ inch exposures. Red paint found at concealed surfaces of the shingles indicate that the wood shingle roof had been painted sometime during its existence.[46]

By the 1930s the roof was protected with roll roofing, probably of the same type that was installed on the house at that time (Figure 4.3). Asphalt strip shingles were laid over the sheathing around 1963, and then another layer of strip shingles installed around 1970. Although the exposed strip shingles were in good condition when the site was acquired by the NPS, the shingles rapidly deteriorated in 1993. Squirrels also wore paths through the shingles from eave to ridge. A 28 gauge, painted metal panel roof laid over wooden battens and the old roof shingles was installed by the NPS in April 1994 in response to severe roof leakage during a heavy Spring rain. The metal roof was intended to be temporary until work commenced to repair the Barn in accordance with the approved treatment recommendations.[47]

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[44] Bill Wenzlick to the author, 8 December, 1994.

[45] Bill Wenzlick to the author, 23 December, 1992. Wenzlick confirmed that the battens were indeed very thin and very much like plaster laths.

[46] The paint is rosy red or Munsell 7.5R 3/6.

[47] The metal panel roof was covered under a twenty year warranty.

A large hip roofed louvered cupola is centered on the primary roof ridge (Figure 4.19). The cupola has been in existence since at least 1875 (Figures 4.1 and 4.2) and probably since construction of the Barn. Cupolas were integrated with barns to provide up-draft ventilation. In Figures 4.1 and 4.2 a tall finial projects from the crest but is not seen in any photo documentation. It is unknown if the finial was decorative, served as a lightning conductor, or was purely imaginary.

An inspection of the existing cupola material indicated that it has high nineteenth century integrity. 1940 HABS photographs show the cupola to be in very poor condition at that time (Figures 4.5 and 4.6). The existing louvers and trim are extremely weathered and consequently in poor condition. Over half of the historic louvers have been replaced. Squirrels have damaged the cornice and a few louvers. Sheathing at the cupola base is very deteriorated. A weather vane at the peak featuring an image of a horse was fabricated and installed during the 1960s by Bill Wenzlick.[48]

Gable roofed dormers, three to each roof leaf, were in existence in 1875 (Figures 4.1 and 4.2). The dormer walls were clad in wood shingles as early as the 1920s (Figure 4.3) and were demolished with the Barn wings just after 1940. A portion of the north elevation center dormer can be seen in the rafters just above the closest horse stall door in the 1940 HABS interior Barn photograph (Figure 4.7). Each of the dormers had six over six, double hung style windows.[49] Corrugated metal sheets fastened to the rafters in two places along the rafters may have provided drainage of rain water which infiltrated the dormer roof valleys or breaches in the roof.

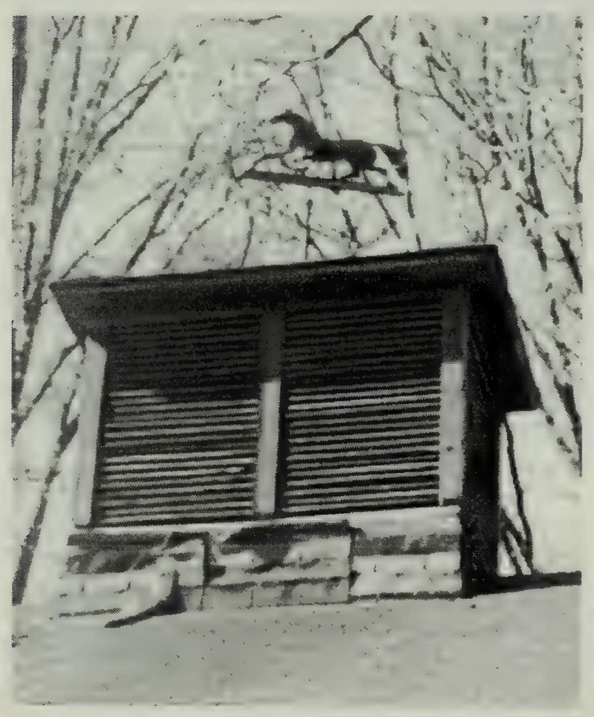

Figure 4.19 - East elevation of the Barn cupola, May 1994. Most of the louvers had been replaced by 1990. (Photo by the author, ULSG collections).

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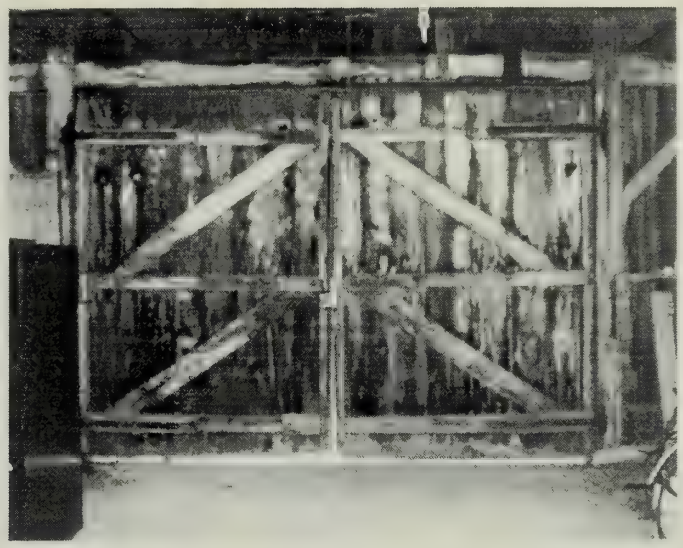
[48] Bill Wenzlick informally to the author. The design was based upon a vane his father saw at Williamsburg, Virginia.

[49] The windows in two dormers can be clearly seen in a photograph taken during the 1930s in the Davis family photo collection.

Figure 4.20 - Interior view of the south elevation Barn doors, May 1994. Note the long strap hinges at the top and bottom battens. (Photo by the author, ULSG collections).



Chimney

A chimney shows on the earliest photographs and illustrations of the structure (Figures 4.1 and 4.3). It is speculated that the chimney was constructed with the Barn. At present there are the remains of an 18 inch by 14 inch brick chimney in the loft room at the north side of the structure (Figure 4.14). The brick stack is supported off the floor by wood framing which is enclosed to serve as a cabinet. The chimney was removed to just above the loft room ceiling between 1940 and 1962.

Doors

Board and batten doors were constructed at each gable end of the Barn (Figure 4.20). The doors were wide and tall to accept the passage of animals, and hay and feed wagons. Both sets of these doors are shown in Figures 4.1 and 4.2 as opening to the exterior; each leaf constructed of two horizontal and one diagonal batten. However, later photographs show the doors with four horizontal battens and two diagonal braces (Figures 4.4 and 4.5). In a 1940 HABS photograph of the then west elevation (Figure 4.6), the north door leaf is clearly open to the interior of the Barn. In the interior photograph (Figure 4.7) that same door appears to be flush with the end wall and its companion door leaf cannot be seen. Bill Wenzlick recalled that the west (now south) set of doors always opened toward the interior of the Barn.[50] It is believed that existing set of large doors at the north elevation opened to the exterior until direction of swing was reversed soon after the 1962 Barn relocation.[51]

The existing gable end doors are believed to have high historic integrity, although about 18 inches have been removed from the bottom edges in response to removal of the entire wood floor system. It is believed that only four of the original six hinges and pintles remain in use today.

Two pedestrian doors remain in the Barn, one in active use and the other used as loft floor material. There is a four panel, machine moulded door at the loft stable jack room entrance (Figure 4.22). Its style and construction are consistent with doors of the late nineteenth century but it is unknown if it is original to the loft room. The door shows evidence of a former rim lock. The door matches the style and construction of a door on the Stone Building which is believed to have been salvaged from the 1940 HABS Room 4 of the Main House (see Division 2, Room Finish Survey, Dressing Room 106). It is possible that this door was installed at the same time Room 4 was constructed or that this door was salvaged from Room 4 when it was demolished by the Wenzlicks in 1940.

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[50] Bill Wenzlick to the author, 8 December, 1994.

[51] James Davis to the author, 18 March, 1993. Davis recalled that the doors swung out prior to 1940.

A board and batten door is nailed to the loft floor joists possibly to replace a section of deteriorated flooring. The door has fabrication techniques comparable to nineteenth century construction. There are only two coats of paint at the lower surface.[52] It is unknown where the door may have come from.

All other doors shown in historic photographs were removed prior to relocation of the Barn. It is not known what became of any of these doors. Doors between the main body of the Barn and the wings were constructed of spaced vertical boards with horizontal and diagonal battens.[53] None of these doors are believed to exist. Doors in the former caretakers quarters were installed in the 1960s. All of these doors were replaced with flush steel and doors by the NPS in 1992.

Windows

Figures 4.1 and 4.2 show that loft floor gable end windows and narrow horizontal stall windows existed in 1875, but details are lacking. Photo documentation records that the loft windows were six over six double hung style (Figures 4.4 and 4.5). Existing loft window sash have been replaced, although original window sash were found stored in the loft.

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[52] WUTA, Sample P-LOFT-571. White and yellow white.

[53] Bill Wenzlick to the author, 13 October, 1992. Wenzlick stated that the gaps between the vertical boards were wide enough that the wing spaces could be seen through the doors from the Barn.

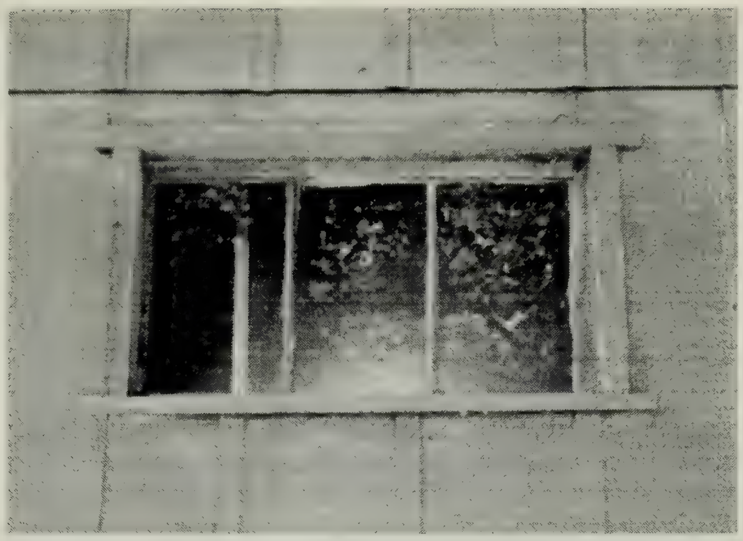

Figure 4.21 - Typical exterior appearance of east elevation stall windows, May 1994. The sash on most of these windows have probably been replaced. West elevation windows are larger, but concealed from exterior view beneath the existing plywood siding. (Photo by the author, ULSG collections).

The stall windows shown in Figures 4.3 through 4.6 had been totally removed with the demolition of the wings. Stall windows still survive at the present east and west elevations, although all are concealed at the west elevation by the plywood sheathing. These windows closely resemble stall windows seen in the historic photos and there is no physical evidence to suggest that the opening locations have not been in existence since construction of the Barn. However, the west elevation windows differ in size from the east windows. The west elevation window frames measure 32 inches wide by 31 inches high; some of them have a single pane sash salvaged from double hung windows. The east elevation window sash measure 34½ inches wide by 20 inches high; each of the sash have three lights (Figure 4.21). Some of the east elevation windows have horizontal iron bars screwed into the frames. Bill Wenzlick recalled that the west elevation window sash were installed to fill holes in the wall when the wing was removed after 1940. The sash were salvaged from elsewhere. Wenzlick also stated that he believed the east elevation sash, including the iron bars, to be original to the construction of the Barn.[54]

There are horizontal sliding stable windows at the existing south elevation ground floor which appear to be historic. The widows are seen in a 1940 HABS photograph (Figure 4.6). The west window framing has been replaced by the Wenzlicks however. The existing ground floor north elevation double hung windows are believed to have been installed by the Wenzlicks. There is no physical nor documentary evidence that windows ever existed at the ground floor north elevation.

Each of the surviving historic window sash and frames is in poor condition, many of the concealed window sash have been removed, and some were completely removed to accommodate installation of contemporary double hung windows when the caretakers quarters were constructed.

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[54] Bill Wenzlick to the author, 8 December, 1994. Wenzlick believes that the bars were installed to prevent horses from poking their heads out of the windows.

A window in the loft stable jack room overlooks the central bay of the Barn interior. There is no remaining sash but evidence suggests that it may have been double hung style. It is believed to be original to the construction of the Barn

Stairs

The original set of loft stairs was located at what is now the north gable end. The stair extended from near the northeast corner directly to the loft door. There was an enclosed closet beneath the stair (Figure 4.22).[55] That stair was removed in 1962, and replaced with a stair at the south end of the 1962 apartment. That stair was removed in 1994 by the NPS.[56] There may have been a stair in the present southwest corner, but there is no physical evidence.[57]

Interior Finishes

As typical with utilitarian farm buildings, the Barn's structure is completely open and unadorned at the interior. The Barn retained its horse stalls, feeder bins, and a compliment of equipment and shelves until their removal prior to the 1962 relocation of the Barn (Figure 4.7). There is still physical evidence at the stable floor posts and loft floor joists in the form of nails, portions of framing lumber, and shadow lines that indicate the former location of the stalls.

Prior to the 1962 Barn move, the floor was constructed of wood plank laid over a heavy timber substructure. A few of the beams were salvaged and are now stored in southwest corner of the Barn. Several lengths of what are believed to be former floor planks were found stored in the Barn loft.[58] The planks measure 2 inches thick and between 10 inches and 13 inches in width, and have 2 inch diameter holes at irregular spacing centered with respect to plank width.

The existing floor is an unreinforced, cast-in-place concrete slab.[59] The apartment floor is also a concrete slab but slightly raised above the level of the Barn floor. The Barn floor is very rough in texture but fairly level.

The loft floor principally consists of 1 inch thick random width boards laid over widely spaced 2 inch by 10 inch joists. The use of patch lumber and plywood signals that the floor suffered from the effects of a deteriorated roof sometime before installation of the present roofing system. To compensate for an extremely deteriorated floor at the southwest corner of the loft, salvaged lumber

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[55] Bill Wenzlick to the author, 13 October, 1992.

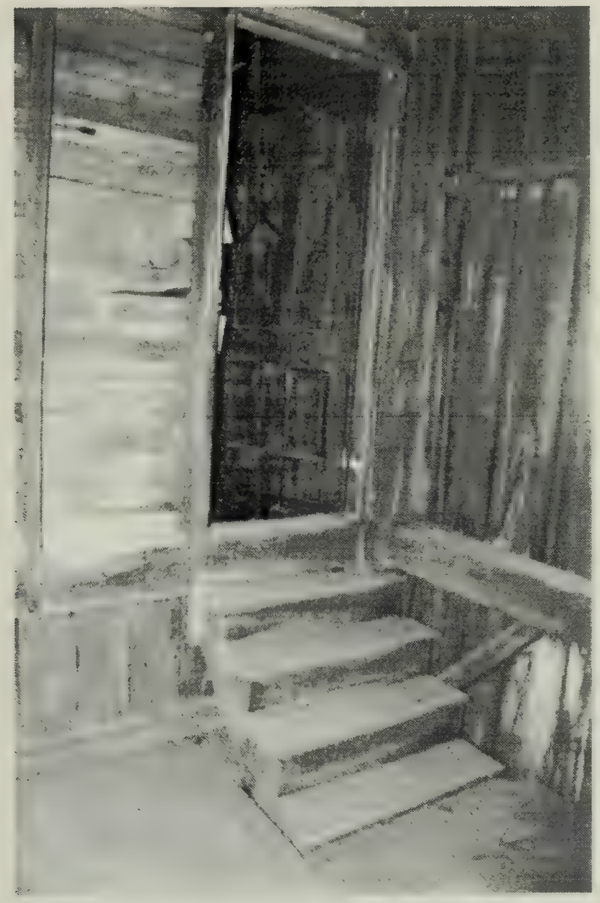
[56] Bill Wenzlick to the author, 13 October, 1992. According to Wenzlick, portions of the original loft stair may have been salvaged to construct the stair at the end of the apartment. When this stair was removed during 1994 work to construct the temporary visitor center, no evidence was detected that any of the stair components possessed nineteenth century integrity.

[57] James Davis to the author, 18 March, 1993.

[58] James Davis to the author, 18 March, 1993. Davis indicated that the floor had holes measuring about 3 inches in diameter, through which livestock urine would drain

[59] Bill Wenzlick to the author, 8 December, 1994.

Figure 4.22 - View of the stair and door to the loft room, May 1994. The stair originally continued to the stable floor level. The lower section was removed in 1962 when the Barn was moved. (Photo by the author, ULSG collections).



is loose laid over extremely deteriorated original floor boards and voids. Overall the loft floor is in an extremely dangerous state of repair.

The south hay lift opening may have been cut through the center bay as late as the 1930s, presumably so that hay could be transferred to the former west end of the loft with little movement of the hay fork system (Figure 4.17).[60]

Butt joints in the loft floor boards form a fairly uniform line running from gable end to gable end near each edge of the center bay structure. The significance of this is speculative given that floor boards are normally staggered over bearing points to augment floor strength. Perhaps the center bay loft floor was open when the Barn was originally constructed as a horse stable and then decked over at a later date. If there were two sets of loft stairs, at the former southeast and northwest corners, each side of the loft deck would have had a point of access.

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[60] James and Charlie Davis to the author, 18 March, 1993, and Bill Wenzlick to the author, 8 December, 1994. The Davis's recalled lifting hay through the hole, and that their father had been responsible for cutting the hole. Wenzlick recalled being present at the cutting work during the early 1930s.

The site of the loft stair remembered by former residents can be seen against the existing north gable end wall just east of the stable jack room. The stair opening has been infilled with boards which clearly show the width of the former stair.

Just south of the former loft stair are two patches of tongue and groove flooring laid over the loft floor boards. The finish flooring has definite limits indicating that there was at least one and possibly two small rooms perhaps associated with the stable jack's room. One angled floor edge seems to correspond to the circulation route of the former stair. Two studs fastened between a rafter and knee brace still remain of the south wall of one room. There are also cut nails and blocking at the rafter, and notches in the edge of the flooring corresponding to other studs which have been removed. The former function of the room or rooms is unknown.

The small loft room is believed to be original to the construction of the Barn. The historic function of the room is unknown, but given that a chimney is present, it is suspected that the room was heated and therefore may have served as an office or stable jack quarters. The room is raised about 3 feet above the loft floor and is finished with beaded board on the ceiling and horizontal board on the walls. All surfaces are painted. The window opening overlooking the center bay and cabinet beneath the brick chimney remains are also believed to have been installed with the room.

There is evidence that surfaces at the interior stable level had been whitewashed which is not surprising given the former use of the structure. No other interior surfaces have been painted.

Hay Fork Track

A wooden track suspended by ½ inch diameter iron rods runs the entire length of the Barn except at the loft room. The rods are hung from collar ties at mid-span between bents and stapled to the bent beams. Ware marks on the top and bottom surfaces of the 4 inch square track indicate that a hay fork carrier was used to transfer hay throughout the loft (Figure 4.13). The track system is in good condition except one collar tie rod is missing from the fourth bay from the north.

Mechanical and Electrical Systems

Direct water supply may not have been installed in the Barn until Albert Wenzlick's ownership. At present, the site water supply line emanates from a water main at Grant Road, and passes beneath the Barn floor to two floor valves within the Barn near the east wall.[61] One of these valves controls supply to the Barn and the other was a shut off valve for a Barn hose bib. All pipe is believed to be galvanized steel. The pipe was installed during the early 1960s; its condition is unknown but suspected to be fair to poor. If the pipe breaks beneath the slab it will be almost impossible to repair in place. All pipe above the floor within the office area servicing fixtures was replaced by the NPS in 1991 with copper pipe. The office pipe was again modified in 1994 during rehabilitation of the space for use as a temporary visitor center and handicap accessible restrooms.

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[61] Bill Wenzlick to the author, 8 December, 1994. Two lines formerly furnished water to each of the Main House and Cottage prior to the Barn move. One line was metered at Grant Road and the other at the west fence line. Both meters were in pits. Water was piped to the Barn by tapping into the Main House line following the 1962 Barn move. During the early 1980s a leak developed near Grant Road in the Cottage supply line after a water meter was struck by a car. As a result of the damage, the Cottage line was connected to the Main House supply line just inside of the west fence line, and the Cottage meter was removed from service. The meter at Grant Road remains in active service for all structures at this writing.

Six inch vitrified clay sanitary drain lines, installed in 1963, service the present restrooms. During 1994 visitor center work it was discovered that all sanitary and vent pipe above the floor level were of soldered copper. Most of this was replaced with PVC pipe in response to new wall and fixture locations. The clay pipe is placed about four feet below the Barn floor and empties into the site trunk line at the north elevation of the Barn. There is no cleanout between the fixtures and the trunk line. The pipe outside of the Barn is clay tile placed about 3 feet below grade during the 1960s. A sewer easement is placed about six feet east of the park's west boundary line.

Natural gas lines were laid during the 1960s from a meter located at the Fernald Drive. The pipes enter the Barn at the furnace closet.

Historically, only the loft room appears to have been heated, probably by wood-burning stove. The apartment was heated and cooled with equipment installed in the 1970s. This equipment serviced the adapted NPS office space until it was inspected and deemed to be not installed to code. The single wall sheet metal furnace flue was found to be in direct contact with loft and roof framing and sheathing, the furnace was improperly wired, and the air conditioner condenser unit was placed in the loft which resulted in inefficient operation. The equipment was replace in 1993 and the air conditioner condenser unit moved to a pad outside the Barn. The furnace was again replaced in 1994, to provide higher output for the temporary visitor center.

The Barn may have been electrified prior to 1920 with the installation of a generator in the north wing. By the end of the 1920s the site was placed on the public electrical system but the generator may have continued to function during power failures. The Barn is currently supplied with power through overhead lines from a pole east of the Barn, although the site service lines pass directly over the Barn roof. Electrical systems within the Barn shell continue to operate a meager pattern of incandescent lights and receptacles. Office electrical panel box, wire, and devices were completely replaced in 1991 by the National Park Service. The electrical system was again replaced in 1994 during temporary visitor center construction work. Barn electrical service is metered separately from other site structures.

A fire and intrusion security system was installed by the National Park Service in 1990, the office by a hard-wired system and the loft area by radio controlled detectors. The radio system was replaced with a hard-wired system in 1993, and modified in 1994 to accommodate the temporary visitor center.

New phone lines were installed in 1991 under contract by the National Park Service via underground cable a telephone pedestal box located at west fence line. The lines service security systems and a single phone line. A repeater antenna was installed in the loft near the cupola by the NPS in 1990 to relay radio calls between the park and JNEM.

RECOMMENDATIONS FOR FURTHER RESEARCH

Archeological mitigation

Although the Barn was relocated from an area about 300 feet southwest of its existing placement in 1962, it is nonetheless recommended that any construction work on the Barn involving ground disturbance be closely monitored. The extent of mitigation is of course dependent upon the chosen treatment alternative. There is no current documentation indicating that any other structures previously occupied the area around the Barn.

Architectural

During construction work on the Barn it is recommended that historic surfaces or finishes uncovered during the work be closely monitored for physical evidence of the following:

- Horse feeder racks along the east interior wall near the northeast corner beneath the office wall and ceiling finishes.
- Placement of the historic loft stair near the interior northeast corner above the office ceiling finishes.
- Former location of windows now concealed by office finishes and plywood cladding.
- Horse stalls and other constructions.
- Interface of the wings with the east and west exterior elevations and rafters beneath the existing plywood cladding.
- Doorways between the existing core area of the Barn and the former wings beneath the existing plywood cladding.
- The six dormers removed with the wings.
- The exposure of historic wood shingles.
- Historic battens which may have been used for shims or furring in the construction of the apartment and elsewhere.

In addition research could be performed in determining the exact use of the loft room.

DOCUMENTATION DRAWINGS

A set of measured drawings was prepared by HABS in 1991 which included plans, exterior elevations, building sections, and a structural detail. No other drawings previous to 1991 are known to exist for the Barn. These drawings are presented in Appendix I - Previous Drawings and Sketches.

PART 2: TREATMENT AND USE

TREATMENT RECOMMENDATIONS AND ALTERNATIVES

The Barn presents an unusual circumstance when compared to other historic structures at the site. Although a large percentage of the 1868 barn remains intact, its site context was greatly altered when the structure was moved in 1962, and all "interior furnishings" such as stalls were removed. This circumstance coupled with the reality that the Barn is in an area highly desirable for development of park visitor services mandates that rehabilitation alternatives be explored and considered. Alternative uses for the Barn will be directed by broader site issues rather than the structure being treated as a singular historic object. Park development is essentially limited to the southwestern corner of the site due to flood plain restrictions imposed by the creek at the north boundary, primary site access from Grant Road, and the desire to maintain the eastern two thirds of the site as a historic zone.

An external influence will also have an impact on use and development of the site. A local private group has negotiated the development of the abandoned rail line at the western boundary of the park as a hiking and biking trail. Although trail development has yet to be realized, it can be certain that the National Park Service will be called upon to provide some support services for trail users.

Since the Barn is out of context with respect to its historic position on the site, and so much of the interior "furniture" such as stables have been lost, it is felt that treatment of the Barn need not parallel the treatment philosophy of the historic core. The following treatment proposals are diverse in nature yet each are certainly achievable depending upon variables imposed by visitor service and/or administrative requirements established for the site.

Class C cost estimates are included with each treatment alternative. The estimates are intended only to provide a comparative association of costs for each treatment. All work is assumed to be accomplished by contract labor. These estimates reflect 1994 costs for completion of the proposed alternative. If implementation of a proposed treatment is delayed, it is strongly recommended that the following figures be reviewed and revised on an annual basis to include adjustments for inflation of materials and services.

In all of the proposals, treatment is similar with regard to the following:

Trees:	Tree branches overhanging the roof should be trimmed back to prevent them from contacting and damaging the shingles.
Storage:	Presently, the ground floor is used for storage of furniture, miscellaneous construction materials, and maintenance functions. It is recommended that the stored items be moved out to reduce visual intrusion and fire load. If possible vehicle storage and maintenance functions should be moved to another structure to prevent

the possibility of fire through the operation of machinery and storage of volatile materials.

Structure: It is recommended that articles remaining in the loft be removed to reduce floor loads, improve inspection visibility, and ease repair activities. Structural repairs will be required at selected sites especially at a broken beam in the central bay and rotted wall plates. The structure will be seismically reinforced.

Loft Floor: Large areas of loft floor boards, particularly along the west bay, should be replaced as these are in extremely deteriorated condition.

Gutters: Although gutters were never installed on the Barn, it is recommended that they be considered at least at the east elevation where water is seen to pond, to prevent roof runoff from splashing and wetting the lower edges of the siding.

Cupola: The cupola is in need of general repair work to ensure long-term preservation.

Barn Doors: The wooden barn doors require the addition of security hardware, and perhaps the tightening of joints.

Paint: All exterior cladding, windows, doors, and the cupola require scraping and painting regardless of the chosen treatment alternative

Fire Suppression: A dry pipe fire suppression system should be installed throughout the Barn. The pipe should be laid out so as not to intrude on the visual qualities of the Barn interior. A new 4 inch to 6 inch water line, valve tree, and siamese for the system must be located within or near the Barn.

Electrical: The Barn aerial service lines should be removed and new service placed below grade to eliminate a potential hazard of lines hanging over the Barn and to remove a site visual intrusion.

Lightning Protection: A certified lightning protection system should be installed to reduce lightning strike hazards.

Treatment Alternative 1
Preservation

This solution assumes that a new visitor contact/office building is constructed separate from the Barn. While design for a new building is beyond the scope of this study, this alternative will strictly address how best to preserve the Barn and present the interior for interpretive purposes.

As the title implies, the Barn will be preserved essentially as it appears today including the retention of the exterior plywood cladding, asphalt shingle roof, and internal visitor contact/office area. However repairs, in addition to structural modifications mentioned above, will be required to safeguard the structure well into the future.

Cladding System
For this proposal it is recommended that the existing plywood cladding be preserved. The remains of the historic vertical board siding would be protected and therefore preserved beneath the plywood. The plywood is in good condition but is in need of scraping and painting.

Roof System
The existing asphalt shingles are in poor condition and required immediate replacement. It is recommended that the existing shingles be stripped from the roof and the board sheathing be inspected and replaced where required. Some of the rafter tails will need repair work at that time also. The weather vane and asphalt roofing installed in the 1960s can remain in place.

Doors
Pedestrian doors into the office areas were replaced with steel doors by the NPS in 1992. Although the doors are handicap accessible, it is recommended that more visually sensitive wood or imitation wood doors be installed.

Windows
For those Barn windows which remain in use it is recommended that they be repaired, cleaned, and painted. The steel bars at the east windows should remain in place even there is some question as to their installation date. The office windows are in good condition and only require painting.

Mechanical Systems
The existing domestic water service line which passed beneath the Barn concrete floor should be abandoned and a new copper service line installed. The line should be metered separately from the other structures.

The clay sanitary lines continue to function but their condition is unknown. If the decision is made to replace all site lines the Barn pipes should be replaced as well.

A dry pipe fire suppression system should be installed throughout the Barn and office areas. The pipe should be laid out so as not to intrude on the visual qualities of the Barn interior.

As mentioned above the heating and cooling systems in the office area were replaced in 1993 and need no further work other than periodic maintenance.

Electrical Systems

The temporary visitor center and office electrical system was totally replaced in 1994 and need not be addressed any further. However lines supplying power to Barn lights needs to be replaced, and more adequate lighting is required throughout the Barn ground floor and loft areas.

Class C Cost Estimate

Treatment Alternative 1

Barn (HS-3)

Repair existing structure, roof, and electrical system ($75/sf)	$300,000
Install fire suppression system	24,000
Subtotal	324,000
Design and contingency (35%)	113,400
Total	**$437,400**

Treatment Alternative 2
Rehabilitation

In this alternative the bulk of the Barn is treated as if the structure had never been moved, yet acknowledges the loss of the first floor structural system and interior "furnishings." It is recommended that the temporary visitor contact and office space be removed upon completion of a new office/visitor center complex elsewhere. Removal of the office space has two advantages; the existing windows, doors, and exposed plywood cladding can be removed and the underlaying historic board and batten siding be repaired, and the entire interior space can be opened to uninterrupted view. It is recommended that historic surfaces uncovered during removal of office finishes be inspected for evidence of the historic feed chutes and horse stalls.

If the existing office and visitor contact space needs to be left in place, there may be difficulties in removing the plywood cladding around windows and doors installed in 1963 without jeopardizing the weather resistance afforded by the existing plywood system. Of course, retention of the plywood cladding ensures that the underlaying historic boards remain in an indefinite undisturbed state. But the interior would remain essentially as it is now with the enclosed office space intruding into the interior of the Barn.

Cladding

The exact extent of repairs cannot be determined until the plywood cladding is removed. However it is anticipated that extensive work will be required to repair the historic vertical board siding that is rotted at the base, was damaged during structure moving operations, and removed when office windows and doors were installed. Some historic material will be lost during the performance of repairs. Appropriately profiled battens will need to be fastened to the board joints to prevent water intrusion. It is recommended that when the plywood is removed, physical evidence such as paint lines or nail hole patterns on the historic siding may reveal information on construction techniques of the historic wings and stables that were removed after 1940.

Roof System

The existing asphalt shingles should be totally removed and the sheathing inspected and replaced as needed. The sheathing should be examined at that time for nail hole patterns which might suggest the exposure of the former wood shingle roofing. Fire treated sawn wood shingles should be installed with nail fasteners. Some rafter tails will need repair work also. The 1960s weather vane should be removed from the cupola.

Reception

Carpet should be removed from the walls and floor. The brick chimney can be rebuilt atop the remains of the existing brick. Otherwise the room can remain in its existing state.

Loft Stair

Removal of the office would result in removal of the existing loft stair. The stair well should be infilled with appropriately sized boards at the loft and a new stair be constructed in the area occupied by the historic stair; at the northeast corner of the Barn. Removal of the office may reveal further physical information on historic stair construction.

Doors

Pedestrian doors will be totally removed upon demolition of the office area. Unless there is evidence for former doors on the east or west elevations, the existing gable end darn doors were provide the only access to the Barn. Removal of the plywood sheathing will certainly relieve excess strain on the hinges but may reveal boards in need of repair.

Windows

The existing office windows should be removed upon demolition of the office spaces and the resultant voids infilled with vertical board siding. All in-place historic ground floor windows should be repaired. Those windows concealed by plywood siding should be restored.

Mechanical Systems

Domestic water supply need not be installed unless hose bibs or a slope sink is required for maintenance use. If domestic water is required it is recommended that a new service line be installed. Since the Barn is completely open in this treatment alternative no heating or cooling service is necessary.

Electrical Systems

Basic electrical service to power lighting, a minimum of outlets, and security systems is all that is required. The electrical panel and meter should be located in a secluded area such as in the loft. A hard-wired fire and intrusion security system should be installed.

Class C Cost Estimate

Treatment Alternative 2

Barn (HS-3)

Demolition	$ 10,000
Repair existing structure, roof, and electrical system ($85/sf x 4,000sf)	340,000
Restore siding	20,000
Install fire suppression system	24,000
Subtotal	394,000
Design and contingency (35%)	137,900
Total	**$531,900**

Treatment Alternative 3
Maintenance Facility

This alternative acknowledges that visitor contact facilities and administrative offices would be located elsewhere. A portion of the existing facility could be developed as a maintenance facility provided precautions are taken to prevent fire or extensive removal of historic material. This alternative could be coupled with Alternative 1 - Preservation, or Alternative 2 - Adapted Restoration in overall treatment of the building. The interior of the Barn could also be open to the public for interpretation if the maintenance facility is sensitively integrated with the historic fabric.

Class C Cost Estimate
Treatment Alternative 3
Barn (HS-3)

Demolition	$ 10,000
Repair existing structure and roof ($75/sf x 4,000sf)	300,000
Restore siding	20,000
Construct new ground floor maintenance facilities ($120/sf x 2,000sf)	240,000
Subtotal	570,000
Design and contingency (35%)	199,500
Total	**769,500**

Treatment Alternative 4

Rehabilitate Existing Space

This treatment proposes to use existing floor space for one or two of the three following functions; visitor services, administrative offices, or maintenance facilities, and restores the exterior envelope. If it is deemed that the site is inadequate to satisfy the construction of new facilities on-site, then the Barn may be able to serve that purpose. Preliminary layout alternatives revealed that it is doubtful that the Barn could only accommodate all three of the primary functions due to spacial constraints. Also, inclusion of a maintenance facility may be incompatible with visitor and administrative functions due to the threat of noise transition. Since the Barn would be deemed a place of assembly, emergency egress doors may intrude on the exterior envelope.

Interior Design

It will be necessary to explore interior functional demands to ensure that sufficient space is available within the existing confines of the Barn to make this alternative viable. It is strongly recommended that any interior design not be forced into the Barn resulting in total loss of interior character, and compromise of exterior building elements. The layout should seek a sensitive balance between spacial needs and preservation of the historic fabric.

Development of the loft area would require sacrifice of historic material in order to attain required floor loading capacity. Therefore it is strongly recommended that interior development be limited to the ground floor only. Construction in the loft would require substantial reinforcement existing structural members, addition of supplemental structural members, and perhaps total loss of the existing historic loft floor boards. Loft development may also require the inclusion of expensive elevators or stair lifts and loss of substantial floor space through the construction of emergency egress stairs. There would also be a deficiency of natural light because there are only two windows at the loft level. At best the loft could be used for light storage if modifications were made to the structural system with minimum loss of historic material.

Class C Cost Estimate

Treatment Alternative 4

Barn (HS-3)

Demolition	$ 10,000
Repair existing structure and roof ($85/sf x 4,000sf)	340,000
Restore siding	20,000
Construct new ground floor facilities ($200/sf)	800,000
Subtotal	1,170,000
Design and contingency (35%)	409,500
Total	**1,579,500**

Treatment Alternative 5
Exterior and Interior Rehabilitation

This alternative acknowledges the importance of maintaining a vista of the Barn interior, while constructing wings for visitor services and administrative offices. The wings would not be a strict reconstruction of the historic wings removed during the 1940s. Instead the wings would be sized to satisfy space requirements for park functions, and sensitively designed to be compatible with the historic core of the Barn. Subtle reminders would be included in the exterior that the wings are a contemporary construction.

As with Alternative 4, space would still be required elsewhere for the function not included within the Barn. Another advantage is that the bulk of the historic siding along the broad east and west elevations would be preserved in place since there would be no need to attain weather resiliency. A disadvantage is that the Barn would be presented as it had never been before; with its wings but without the lower 18 inches of the floor system. However, it is felt that the wings could be designed to be distinguishable from the historic core of the Barn. Another disadvantage is that if all ground floor space were occupied for contemporary uses, interpretation of the Barn interior would be sacrificed.

Class C Cost Estimate
Treatment Alternative 5
Barn (HS-3)

Demolition	$ 10,000
Repair existing structure and roof ($85/sf x 4,000sf)	340,000
Restore siding	15,000
Construct new ground floor facilities ($200/sf x 4,000sf)	800,000
Construct new wings ($230/sf x 3,200sf)	736,000
Subtotal	1,901,000
Design and contingency (35%)	665,400
Total	**2,566,400**

ULTIMATE USE AND DESIGN DEVELOPMENT

Barn use in the context of future operation of the park was addressed at length during development of the site General Management Plan. It is the recommendation of the GMP team that exterior and interior rehabilitation, Treatment Alternative 5, is best suited in providing long-term space for visitor services and administrative offices. The team also recommended that maintenance facilities be located elsewhere away from the visitor center. It was felt that maintenance vehicle circulation and generation of maintenance activity noise is incompatible with visitor site circulation and experience.

During development concept plan meetings, the GMP team recommended the functions and associated area that should be included within the Barn development. The following functions shall minimally be included in the design:

VISITOR SERVICE	AREA	ADMINISTRATIVE	AREA (sf)
Information	130	Reception	100
A/V presentation (capacity: 80)	800	Superintendent's office and restroom	300
A/V projection room	60	Administrative Officer's office	150
Exhibits	800	Chief of Interpretation office	150
School group room	400	Interpreter's work space (4 stations)	200
Education specialist office	150	Facility Manager's office	150
Sales area and office	400	Law enforcement office	150
Sales storage	250	Cultural Resource Specialist's office	150
Public restrooms and water fountain	400	Secretary's office	150
Receiving and storage	150	Conference room	200
First aid	100	Library	250
General storage	400	Collections storage	400
Circulation	300	Mail handling	100
HVAC	800	Central files	50
		Employee break room	200
		Employee restrooms	160
		General storage	300
		Circulation	300
		HVAC	300
Total Area	**5,140**		**3,760**

The following recommendations should be considered as preliminary design program requirements for future development of the Barn.

Barn development should be limited to the ground floor only. Useable loft area would be greatly reduced by; diminished headroom due to roof slope and diagonal braces projecting into the space, elevator installation as required for accessibility, and installation of two stairwells required to satisfy egress requirements. In addition, most of the existing historic loft floor and framing system would be lost through replacement due to structural requirements.

Since the total required area of almost 9,000 square feet is limited to the ground floor, new construction would be required to expand the existing 4,000 square feet of ground floor Barn space. This can be accomplished through construction of wings on the east, west, and south elevations. It is recommended that the theater be placed in the south wing as there would be more flexibility in providing an unobstructed space at that location than in the existing Barn or new wings. If the Barn is to remain in its existing location, east and west elevation wing construction would be limited to about seventeen feet beyond the Barn due to property line constraints and the desire to maintain wing scale within the context of the historic portion of the Barn.

Exterior surface materials of the new wings should emulate historic construction technologies while maintaining a sense that the wings are a contemporary addition. The use of vertical board and batten siding systems should be investigated. While wood shingles should be placed on the roof of the historic portion of the Barn, wing roofs may be too shallow for wood shingles. Therefore alternative roofing systems such as standing or flat seam metal should be explored for the wing roofs. Stable stall windows similar to those on the historic wings and the existing Barn should be considered for installation on the new wings to provide natural light to interior spaces. Dormers removed with the historic wings should be added to the new roof. Dormer light wells can be designed to provide skylight to interior spaces.

The historic fabric of the existing Barn shall be retained and incorporated as much as possible into the new design. The character of the historic Barn should be exposed to view particularly at interior areas open to the public. New spaces including classroom, public restrooms, gift shop, and offices should be placed in the new wings as much as possible.

There is a desire to incorporate a view of the loft through the hay lift opening at the north end of the Barn. In the context of site circulation and the loft view, public entry through the north barn doors should be explored.

Construction of basement space beneath a portion of the wings should be considered to satisfy placement of general storage area and HVAC equipment. Basement location may be limited to the southern half of the Barn by flood plain encroachment.

Mechanical, electrical, and lighting systems should be sensitively designed and placed in the historic portion of the Barn so as not to severely damage the historic fabric or otherwise injure the character of the old Barn. It is strongly recommended that ground source HVAC systems be explored for installation. Use of such a system will reduce long-term energy usage and costs, and eliminate exterior condenser units associated with existing conventional air conditioning systems. Water-conserving plumbing fixtures should be specified for all restrooms. The entire structure should be protected with a sprinkler system. A gaseous fire suppression system should be considered for the collections storage and library areas. A lighting protection system should also be installed on the Barn.

It is possible to raise the height of the existing Barn to provide for increased interior headroom and a wood framed floor system. Holes in the existing posts can be used to lift the structure as was done in 1962. Once lifted, the existing foundation would probably need to be replaced as would the floor slab. Another alternative with, the goal of providing on-site parking space west of the Barn, would be to raise and move the Barn about 90 feet east of its present location. The new location would also place the Barn outside of the flood plain zones.

Class C Cost Estimate

Design Development

Barn (HS-3)

The following costs reflect construction work to repair and preserve the existing historic core area of the Barn, and construct new wings at the east, west, and south elevations to accommodate visitor services and park administrative offices.

Demolition	$ 15,000
Repair existing structure and roof ($85/sf x 4,000sf)	340,000
Restore siding	15,000
Construct new visitor center within confines of existing barn space (2,600sf x $200/sf)	520,000
Construct new visitor center wing at east elevation (1,700sf x $200/sf)	340,000
Construct new offices within confines of existing barn (1,300sf x $160/sf)	208,000
Construct new office wing at west elevation (1,700sf x $180/sf)	306,000
Construct new theater wing at south elevation (2,200sf x $240/sf)	528,000
Subtotal	2,272,000
Title 1 and 2 Design Services	500,000
WASO Contingency (31%)	700,000
Total 1	**$3,472,000**

Add Total 2 to Total 1 to raise Barn to new level and construct new foundations and floor system:

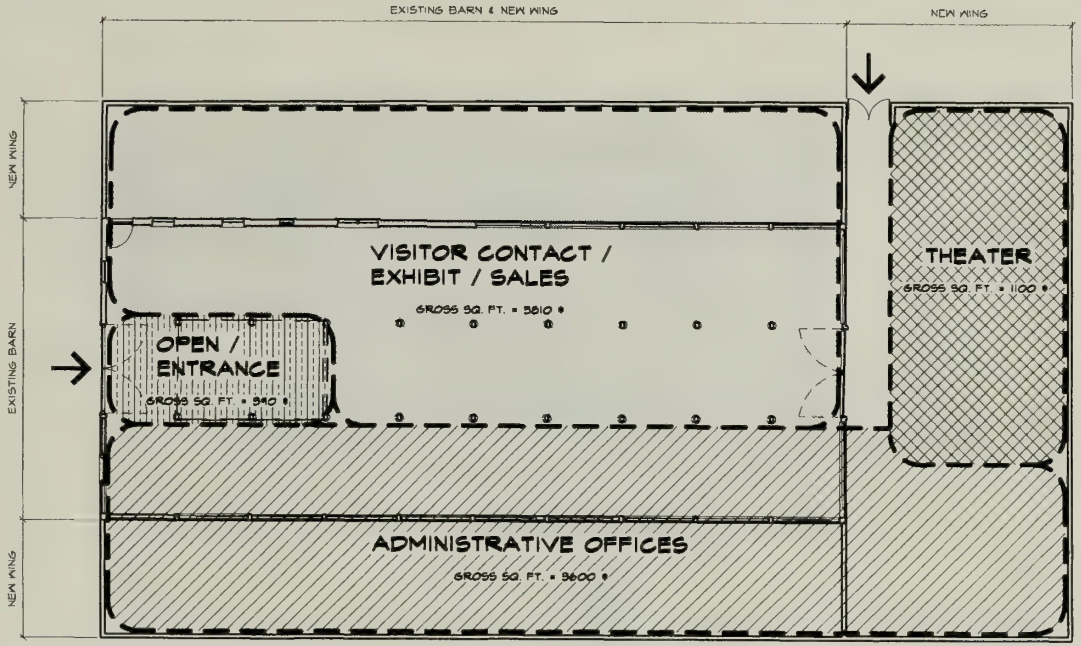
Lift structure	40,000
Demolition	20,000
New foundation work	160,000
New floor system	120,000
Subtotal	340,000
Title 1 and 2 Design Services	55,000
WASO Contingency (31%)	105,000
Total 2	**500,000**

Add the Total 3 to Total 1 and 2 above to move Barn to new location

Lay out new foundation	10,000
Move Barn	25,000
Subtotal	35,000
Title 1 and 2 Design Services	5,500
WASO Contingency (31%)	11,000
Total 3	**51,500**

DESIGN CONCEPT DRAWINGS

The following drawings were produced to convey the concepts behind the preferred treatment for the Barn. While historic precedence exists for constructing new wings for the Barn, the size, massing, materials, and detailing of these additions including the theater wing, will ultimately be determined during the design development process. The new additions will conform to the latest edition of the *Secretary of the Interior's Standards for Rehabilitation.*


EXISTING BARN & NEW WING
NEW WING
NEW WING
EXISTING BARN
NEW WING
VISITOR CONTACT / EXHIBIT / SALES
GROSS SQ. FT. = 5810 ±
OPEN / ENTRANCE
GROSS SQ. FT. = 540 ±
THEATER
GROSS SQ. FT. = 1100 ±
ADMINISTRATIVE OFFICES
GROSS SQ. FT. = 3600 ±

FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"

CONCURRED
ASSOCIATE REGIONAL DIRECTOR DATE
APPROVED
REGIONAL DIRECTOR DATE

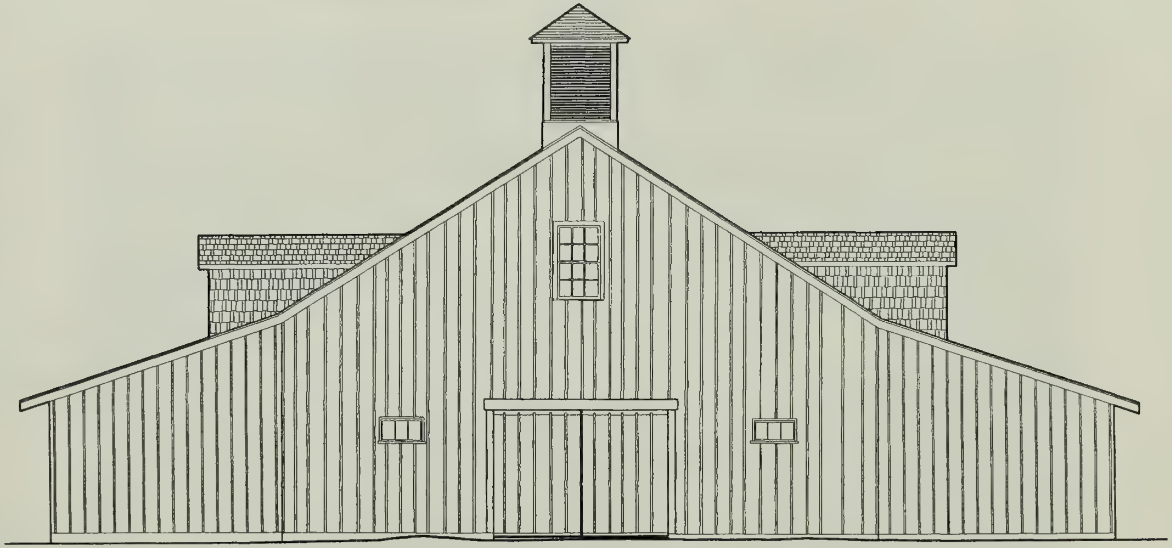
RECOMMENDED
SUPERINTENDENT DATE
CHIEF CULTURAL RESOURCES MANAGEMENT DATE

DESIGNED
DRAWN
L. M. JOHNSON
TECH REV
A. R. O'BRIGHT
DATE
JUNE 30 1994

SHEET TITLE
DESIGN CONCEPT DRAWINGS
FLOOR PLAN
BARN (HS-3)
ULYSSES S. GRANT NHS
ST. LOUIS, MO

AUTOCAD FILE
BNDFP01
SUB SHEET

DRAWING NO
357/80010
SHEET 1
OF 3



SOUTH ELEVATION

SCALE 1/4"= 1'-0"

0 1 2 4 8

DESIGNED	SHEET TITLE	AUTOCAD FILE BNODEEIN	DRAWING NO 357/80010
DRAWN L H JOHNSON TECH REV A. R. O'BRIGHT	DESIGN CONCEPT DRAWINGS EXTERIOR ELEVATION BARN (HS-3) ULYSSES S. GRANT NHS ST. LOUIS, MO	SUB SHEET	SHEET 3 OF 3
DATE JUNE 30 1994			

DIVISION V - ICE HOUSE (HS-4)

INTRODUCTION

The Ice House is located about 50 feet northwest of the Stone Building (HS-2) and is believed to be depicted in an 1875 lithograph (Figures 2.6 and 5.3). The earliest known illustration of White Haven, however, indicates that the building may have been there by 1840 but with a superstructure which differs from that of today (Figures 5.1 and 5.2).

No one is certain of the original use of the structure and for many years there has been controversy over its function. The building has often been referred to as the spring house while other thoughts hold that it was once a smoke house, an ice house, or a combination of two of the three. The building has primarily been used for storage in its recent past and will serve as an interpretive piece in its future with the National Park Service. The integrity of the structure has been undermined by unchecked growth of trees, insect damage and the removal of collar-ties that once stabilized the rafters against the weight of the building's cupola.

PART 1: DEVELOPMENTAL HISTORY

HISTORIC PHOTOGRAPHS AND ILLUSTRATIONS

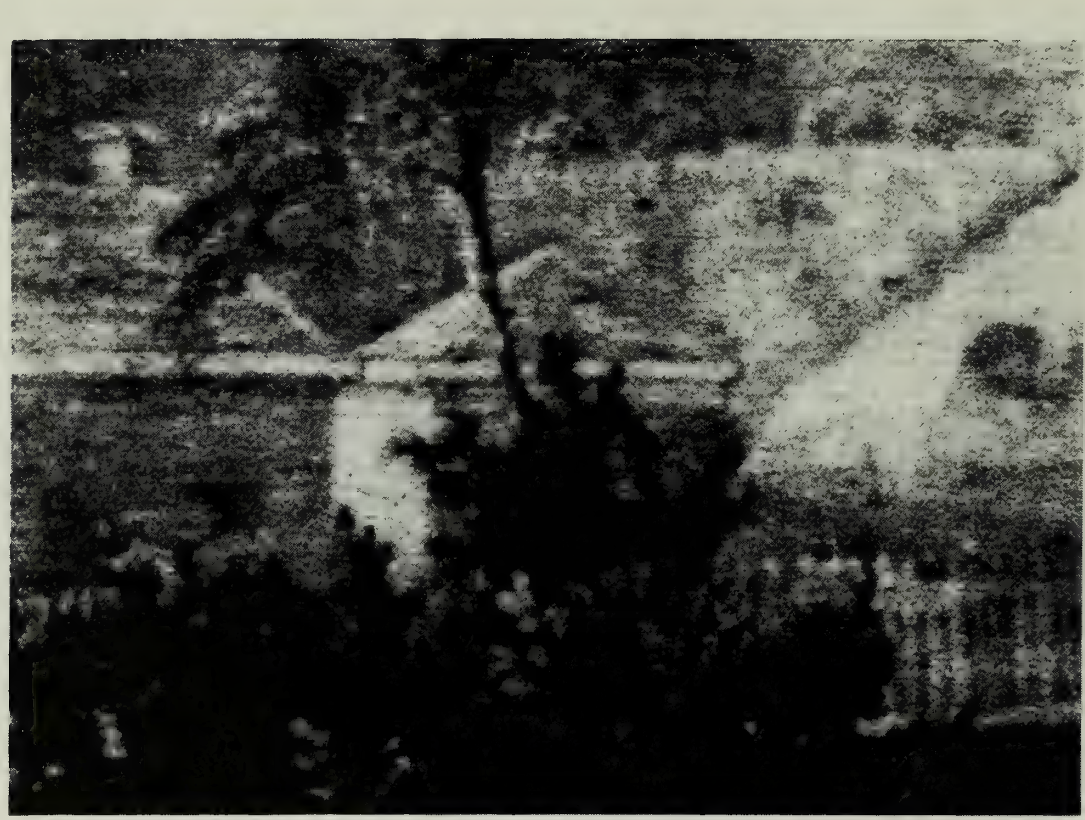


Figure 5.1 - Detail from "White Haven, the House in Which and Where I was Born-August 29,1816." The Ice House is believed to be represented by the hipped roof structure in the center of this illustration. See Figure 2.1 for complete view of the illustration. (Circa 1880 album print of circa 1840 painting reprinted by permission of the Missouri Historical Society).

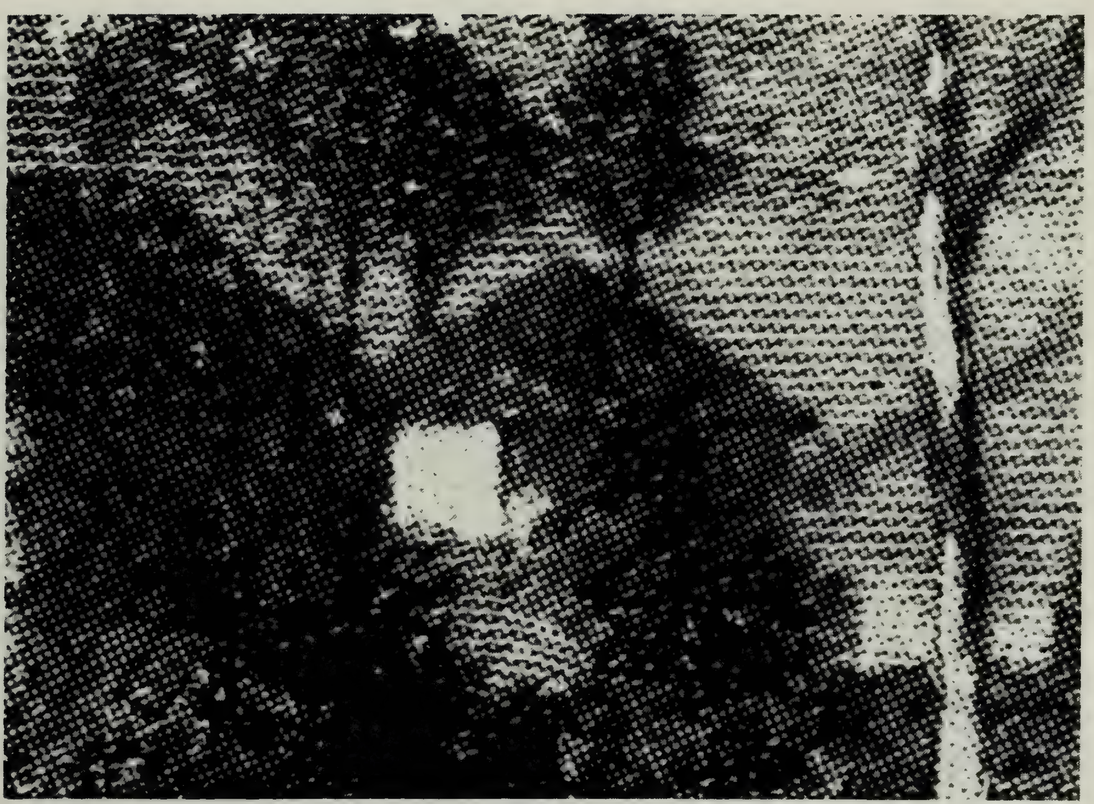


Figure 5.2 - Detail from "'Whitehaven' the Dent Homestead near St. Louis, Missouri. Redrawn from an Old Drawing Owned by Mrs. Grant." This illustration was copied from the painting seen in Figure 5.1. The Ice House is believed to be represented by the hipped roof structure in the center of this illustration. See Figure 2.2 for complete view of the illustration. (Undated print reprinted by permission of Missouri Historical Society).

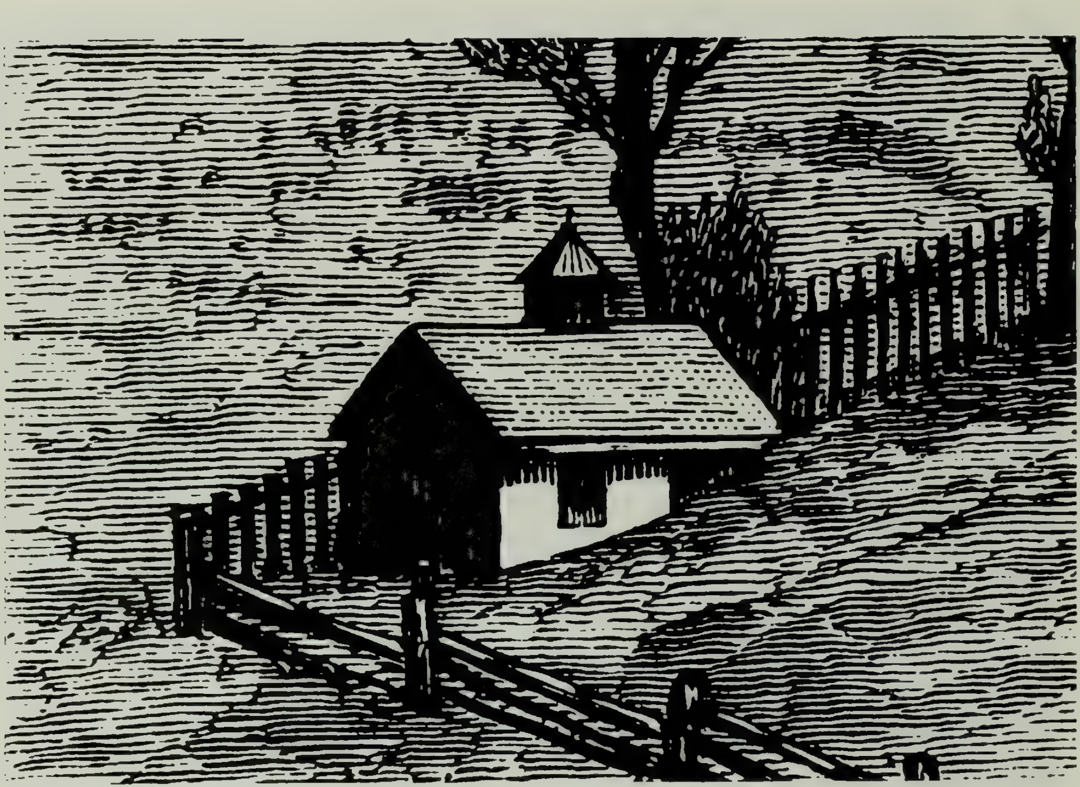


Figure 5.3 - Detail of the Ice House from "Missouri-President Grant's Farm Near St. Louis." This 1875 illustration view of the Ice House from the northwest clearly shows that the structure was very similar to the structure that remains today. See Figure 2.6 for complete view of the illustration. (Engraving from sketch by William Staengel, *Frank Leslie's Illustrated Newspaper*, (October 16, 1875), 93, ULSG collections).

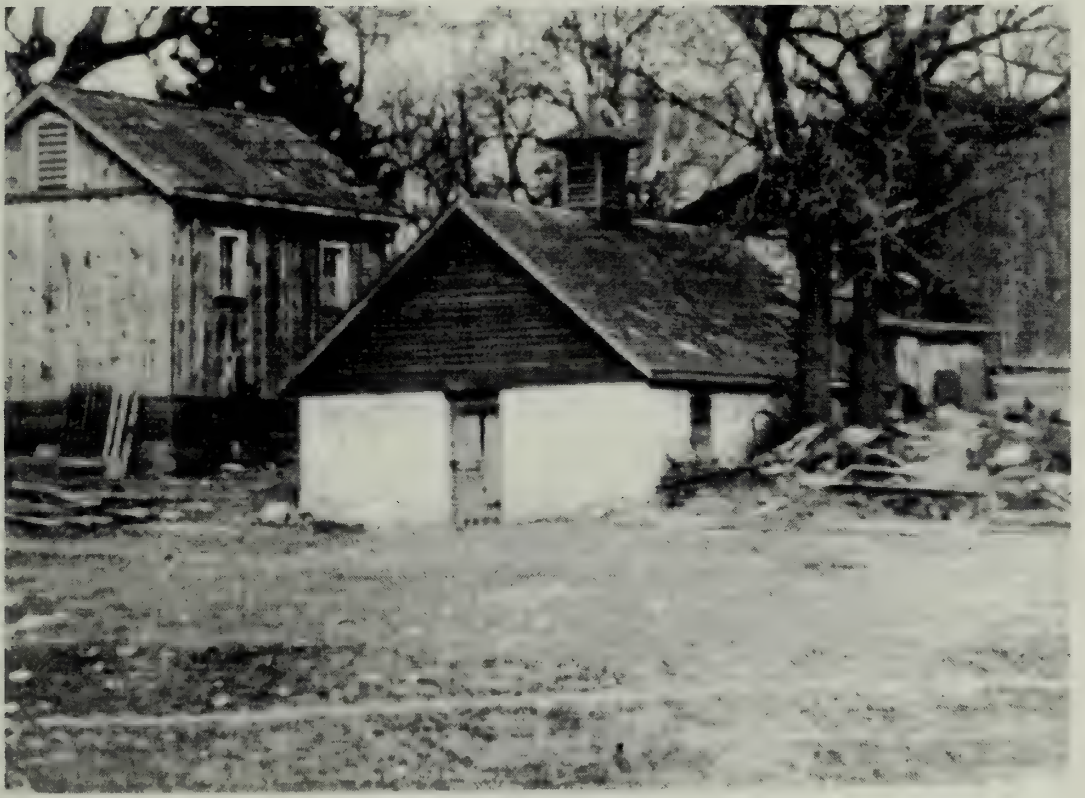


Figure 5.4 - View of the Ice House from the Northwest, 1913. This is the earliest known photograph of the structure. (Detail from photograph in Bill Wenzlick collection).

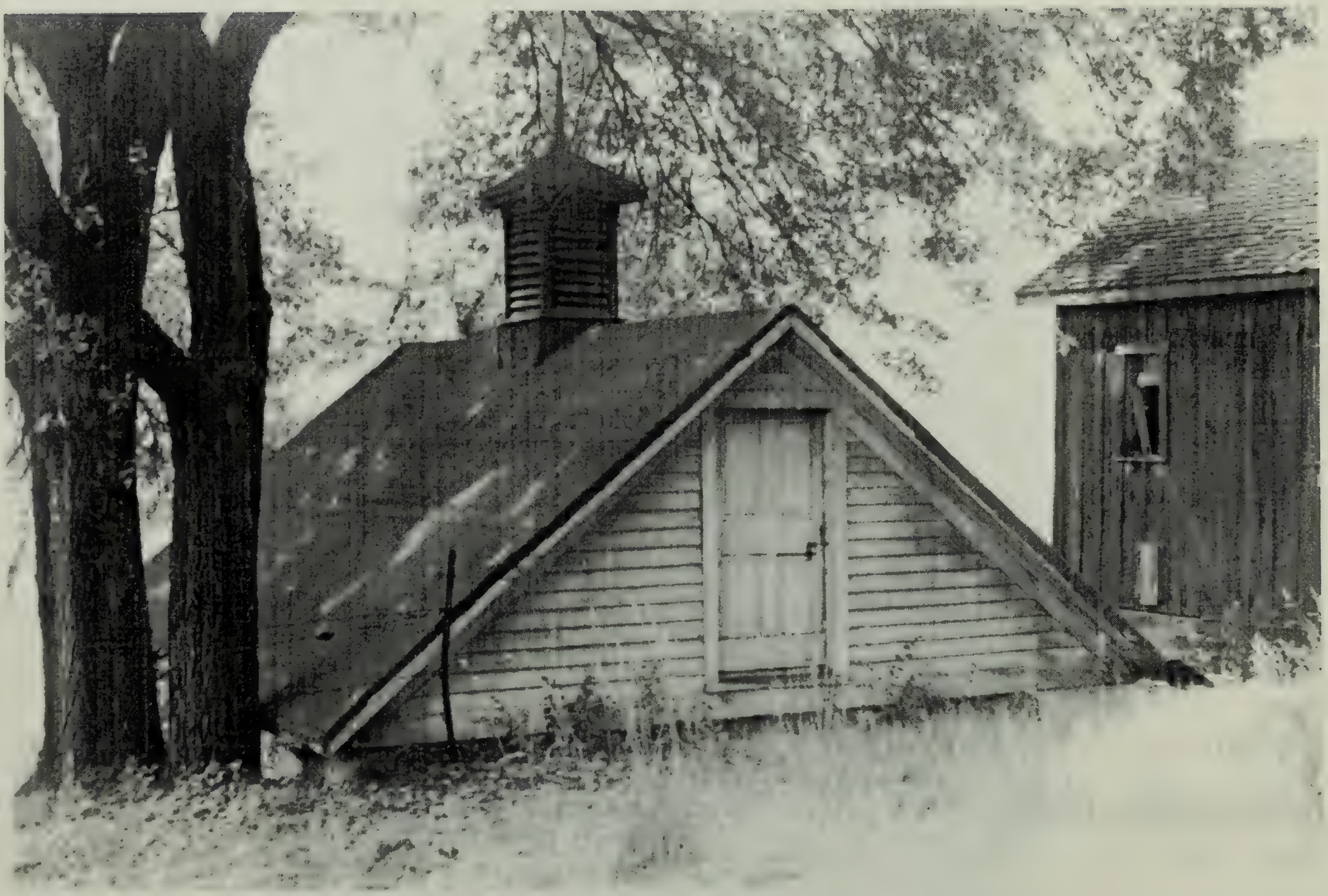


Figure 5.5 - View of the Ice House from the southwest, 27 July, 1940. (Lester Jones, photographer. Detail of photograph in HABS collection, 112179-HABS MO., 95-AFT, v. 1B-1).

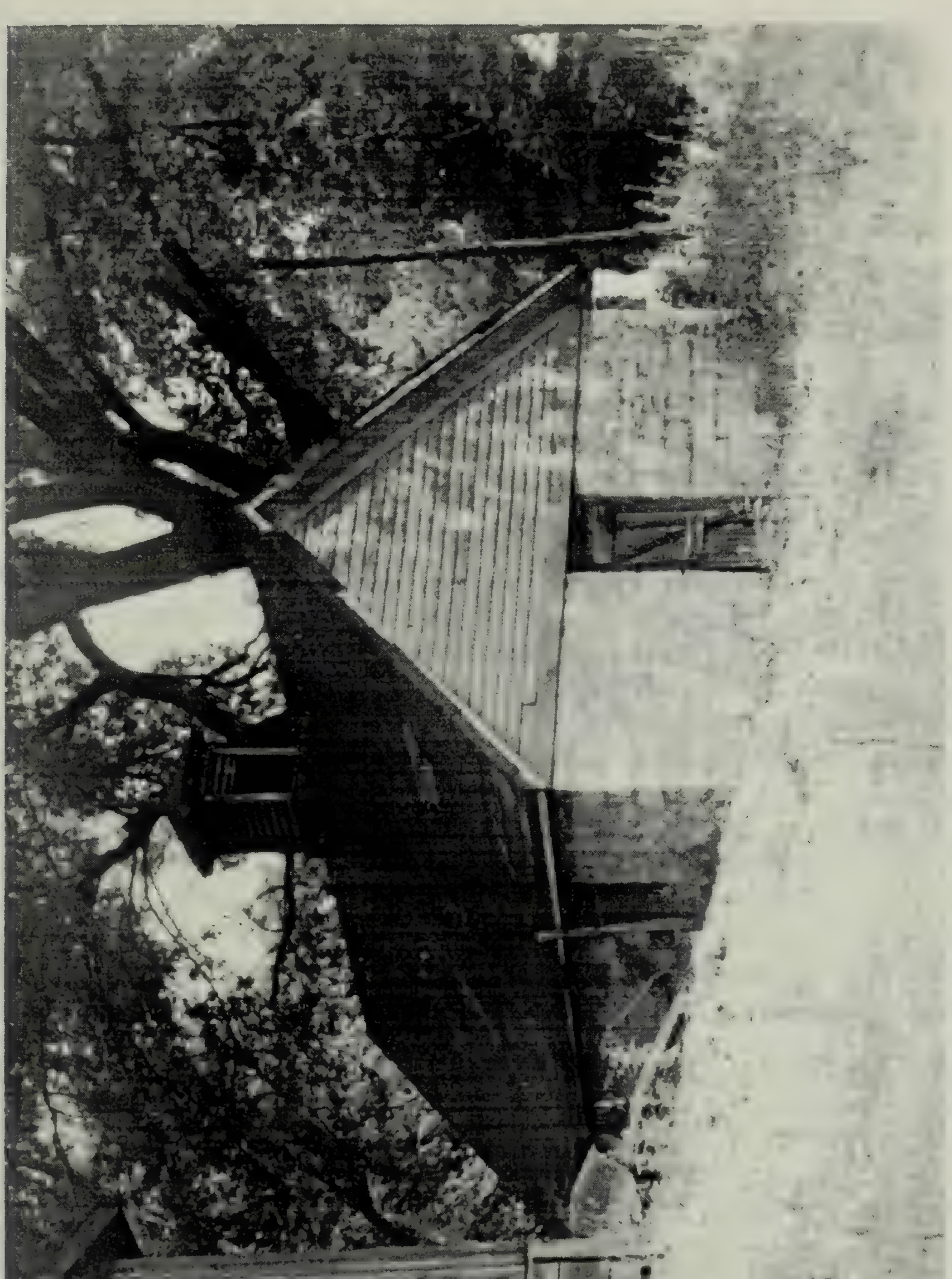


Figure 5.6 - View of the Ice House from the northeast, 27 July, 1940. (Lester Jones, photographer. Detail from photograph in HABS collection, 112179-HABS MO., 95-AFT, v. 1B-2).

BUILDING DESCRIPTION

Described as a spring house or smoke house for many years, evidence indicates this "barn red" structure was originally constructed as an ice house. This structure is set into a northwest facing hill overlooking the Prairie Spring at the north property line. The perimeter of the rubble limestone foundation walls measure about 23 feet by 18 feet with a stone partition that divides the interior into two equally sized rooms. The north portion of the foundation wall is mostly above ground while the south portion is below the ground's surface (see 1992 HABS drawing, longitudinal section). The existing superstructure is a light wood framed gable roof bearing asbestos/cement shingles laid over roll roofing and board sheathing while the gable ends are sheathed in machine-sawn, beveled clapboard siding. The structure features three window openings, two doors and a recently added floor at the top of the foundation. The ground or "basement" floor is covered with a combination of rubble and dirt. A louvered cupola with a pyramidal roof surmounted by a finial is located at the center of the building's gable roof. Combined dead loads of the cupola and roof are causing the ridgeline to sag. Overall, the structure is in poor condition.

ARCHITECTURAL ANALYSIS

For many years, building HS-4 has been locally described as a spring house; although, that has been the focus of some debate.[1] In some cases, the building has been described as a smoke house.[2] While there is some belief that the structure was a smoke house/spring house, witnesses have stated that the structure served as a combination smoke house/ice house during the twentieth century.[3] Ulysses S. Grant, in a letter to farm caretaker William Elrod, wrote, "I do not want Mr. Sappington or the Dr to fill my ice house," leading to the conclusion that an ice house must have been at White Haven by 1867.[4]

Evidence from a circa 1840 painting indicates that this structure may have existed at that time, but with a different superstructure (Figures 2.1 and 5.2). The illustrations, from a southeast vantage point, show a hipped, rectangular roof clearly standing north of the Stone Building in the approximate location of where the Ice House stands today. No cupola is displayed and it appears that the roof is set on top of walls which are more than five feet tall. It is strongly suspected that the extant superstructure post-dates construction of the stone substructure by many decades; although, the physical evidence supporting this theory is circumstantial at best. Given the apparent differences in construction between the images seen in the 1840 painting and the 1875 lithograph, it is believed that a major revision was made to the structure. The exact reason for the change is unknown. It is possible that deterioration and/or high winds may have caused the building to collapse, requiring that a new structure be constructed on top of the remaining foundation.

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[1] Bill Wenzlick to the author, 12 March, 1992. "To my knowledge it [the Ice House] was never a spring house." Wenzlick stated that the only spring he knew of "would now be about 20 feet under Whitehaven Drive." James Davis and Charles R. Davis to Al O'Bright, 18 March, 1993. "There was a spring house adjacent to the creek about 20 yards east from the opening of the existing culvert." (see Division VII, Spring House). There was a separate structure on the property which did function as a spring house, but it is no longer extant.

[2] Esley Hamilton, "National Register of Historic Places Inventory-Nomination Form (White Haven)," (Washington D.C.: U.S. Department of the Interior, 18 January, 1979), Item 7, p. 5.

[3] Marjorie Abbott Felice, Letter to William Bodley Lane, 5 August, 1987). Felice mentions a "smoke house...built into the steep bank of a ravine, with a `spring house' on the rear, opening from the lower level; Bill Wenzlick to the author, 12 March, 1992. Wenzlick indicated that he remembers seeing a lot of saw dust in the north room of Outbuilding A but does not remember if he ever saw ice in the room. Wenzlick also said that he saw ashes in the south room and believes that meat was hung from the sapling logs [which span the room from north to south]; James Davis to the author, 18 March, 1993. Davis said, "We used to haul 300 lb. blocks of ice from Polar Wave in Affton and we stored them in the north room of the building [Ice House]. Mr. Busch frequently dropped off ice for the ice house on his way home." He also said, "The smoke house was on the south side. We went down a ladder to the pit and stoked the fire on the dirt floor there. There were poles that ran from east to west that were used for hanging meat.

[4] USG, *Papers*, 314. The letter is dated 4 September, 1867.

In the August 5, 1846, edition of the *Missouri Republican* under an advertisement for "Improved and Unimproved Land For Sale", the White Haven Farm was listed. Included in the description were "...a commodious frame dwelling containing nine rooms,...smoke and dairy houses of stone, together with all other out-buildings, barns, & c., that can be desired on a well improved farm."[5] Although the ad did not specifically mention an ice house, it is possible that the "dairy house of stone" could have been what is the existing structure; it may also be that the existing outbuilding could have been the "smoke house."

In her memoirs, Julia Dent Grant mentions that "molasses, tobacco, and some whiskey..." along with "everything farm produced, such as vegetables, bacon, beef, and, of course, poultry," was issued regularly to her father's slaves from the storehouse.[6] Considering the perishable nature of these goods, it is believable that the storehouse could have been an ice house with a cooling room.

Although the function of the original structure is not known, the presence of the cupola at the center of the contemporary roof reduces the possibility of the building functioning as a spring house. Typically, a spring house required a "ceiled roof" to prevent freezing in the winter.[7] The cupola does, however, suggest that the building may have been a smoke house or an ice house, therefore leading to a comparative study of the three building types.

Siting

Wherever an ice house was built, it needed to be located in an area that had perfect drainage to be successful in keeping the ice.[8] Generally, drainage was secured by placing the structure on sloping ground.[9] Nineteenth century designers contended that the ice house should be built above ground; if not, it was desirable to build into the side of a hill with a northerly exposure while making sure

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5. Missouri Historical Society, "Improved and Unimproved Land For Sale," *Missouri Republican*, 5 August, 1846.

6. JDG, *Memoirs*, 34.

7. *Barn Plans and Out-*Buildings, 173.

8. A.J. Campbell, *American Practical Cyclopaedia*, (Cleveland, Ohio: A.J. Campbell, 186) 8, 282 (hereafter cited as Campbell, *Practical Cyclopaedia*). *Barn Plans and Out-Buildings*, 141 and 149. D.H. Jacques, *The House*, 147.

9. *Barn Plans and Out-Buildings*, 146.

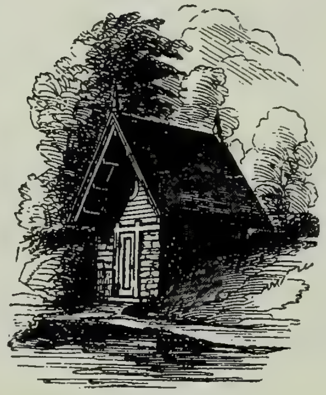


Fig. 19.—Ice-House.

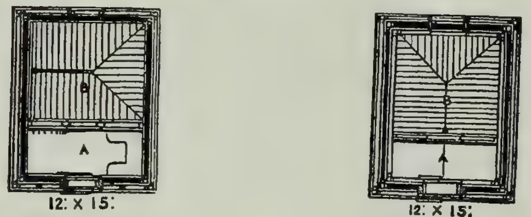


Fig. 20.—Plan of Fig. 19.

Fig. 21.—Plan of Fig. 22.

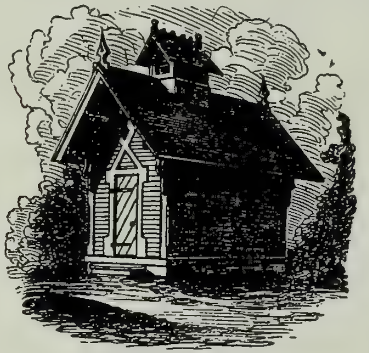
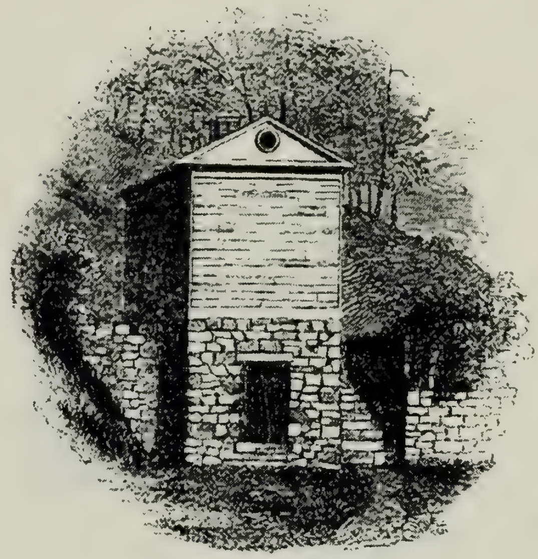


Fig. 22.—Ice-House.

Figure 5.7 - Illustrations and plans of two ice houses; one built into a "gravelly bank," and the other constructed above grade. The top illustration, "Fig. 19," shows a resemblance to HS-4 at White Haven. (Reprinted full size from George E. Woodward, *Woodward's Cottages and Farm Houses*, (New York: The American News Company, 1867), 20).

Figure 5.8 - "An Ashery and Smoke House." This is one example of a banked smoke house. (Reprinted from D.H. Jacques, *The House: A Manual of Rural Architecture*, (New York: Geo. E. & F.W. Woodward, 1866), 146).

Fig. 110.



An Ashery and Smoke-House.

to pay close attention to drainage (Figure 5.7).[10] It was important to position the ice house in a place most convenient to the dwelling, or to the wants of the users.[11] A location near a stream, pond or lake was also essential for easy access to the ice.

In creating a smoke house, all that was needed was..."a room, from the size of a barrel to that of a barn..."[12] Generally, the smoke house could be built in any location. In some cases, the structure was built into a side-hill with a brick or stone ash-pit below and a wood framed smoke-house above, making it a two story building (Figure 5.8). A side-hill situation was by no means essential for the function of this building type though.[13] Some smoke houses consisted of brick structures built over a deep ash pit or cellar, but common smoke houses were built on grade with either a centered stone slab or a pit to accommodate a fire (Figure 5.9).[14] In some cases, the fire was built in the rear of the building (Figure 5.9, no.112).[15]

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[10] Lewis F. Allen, *Rural Architecture*, (New York: Orange Judd, Publisher, 1865), 258 and 263 (hereafter cited as Allen, *Rural Architecture*). Campbell, 282. *Jacques, The House*, 149, and Geo. E. Woodward, *Woodward's Cottages and Farm Houses*, (New York: The American News Company, 1865), 21 (hereafter cited as Woodward, *Cottages and Farm Houses).*

[11] Allen, *Rural Architecture*, 258.

[12] *Barn Plans and Out-Buildings*, 187.

[13] Jacques, *The House*, 145-146.

[14] *Barn Plans and Out-Buildings*, 187-188.

[15] Woodward, *Cottages and Farm Houses*, 81.

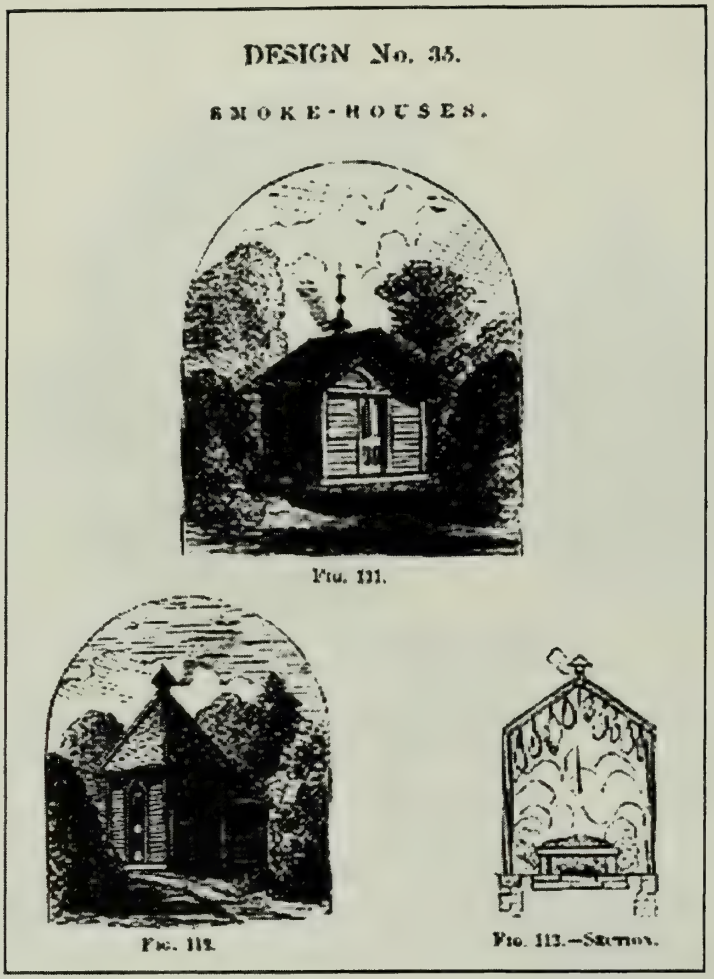
DESIGN No. 35.
SMOKE-HOUSES.
Fig. 111.
Fig. 112.
Fig. 113.—Section.

Figure 5.9 - "Smoke-Houses." Two common smoke houses are illustrated here. "Fig. 113" shows the location of the fire and meat. (Reprinted from George E. Woodward, *Woodward's Cottages and Farm Houses*, (New York: The American News Company, 1867), 81).

The existing structure is sited on a north facing hill directly behind the Main House and the Stone Building. It is built into the hill with most of the north elevation exposed above ground (Figure 5.6). The Prairie Spring lies 50 feet north of the structure providing a perfect location for the retrieval of ice. Of course, it's locality does not prove that the structure was originally an ice house, but the characteristics of an ice house are present. In regard to the possibility of the structure having been a smoke house, it does have a convenient location to the Stone Building which is believed to have been a summer kitchen during the early nineteenth century (see Division III, Architectural Analysis); the same can be said in the event that the building was once an ice house. With respect to the typical spring house location, this structure does not fit the standard description. Spring houses generally were located near the spring or the water was conducted through pipes placed at least four feet under ground to insure coolness of water.[16] So far, neither of these spring house characteristics have been found to exist with regard to the present Ice House.

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[16] *Barn Plans and Out-Buildings*, 170.

Size/Shape

Two nineteenth century designers stated that the minimal size of an ice chamber was 12 feet square, while one prescribed that a room be not less than 10 feet inside.[17] Another designer went farther and said, "About twelve feet cube of ice is the requisite quantity for most families, and a bulk of this size keeps better than if smaller."[18] Most ice houses had four walls mounted by a vented gable roof but some had hipped or shed roofs. When an ice house was not available, ice blocks were stacked in a favorable place (against a bank or an incline) and covered with a thick layer of straw held in place by boards.[19]

As formerly stated, a smoke house had no real restrictions in size.[20] Roof shapes of smoke houses varied from gabled, to hipped, to arched or oven shaped, frequently supporting a chimney stack. Sometimes, when no smoke house was at hand, a large cask or barrel was used as a substitute.[21]

The existing outbuilding is a rectangular structure with a foundation that measures 22 feet 7¼ inches by 17 feet 8 inches and is mounted by a gabled roof (see 1992 HABS drawings). The foundation is divided into two equally sized rooms which measure about 15 feet by 9 feet by 8 feet or 9 feet deep, just slightly under the 12 feet cube recommended for storing ice.

Massing

Ice houses that were built above ground were generally square or rectangular, preferably with one door opening above the level of the ice on the north or west side.[22] Depending on the shape, the roof was either a pyramidal (four-sided), a gabled (two-sided), or a shed (one-sided) roof. If the ice house was built under-ground or into the hill, leaving little more than the roof to show, it was recommended that the roof be only two sided with the door placed in the gable at ground level (Figure 5.10).[23] It was necessary to have some kind of vent cap at the roof ridge or a vented window in one gable end to allow air movement to prevent condensation (Figures 5.11 and 5.12).

Sometimes, an ice house was combined with, or attached to, a cooling room for storing milk, butter, meats, fruits and other perishable goods. Many times the rooms were under one roof and separated

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[17] Allen, *Rural Architecture*, 259. *Barn Plans and Out-Buildings*, 157. *Campbell, Practical Cyclopaedia*, 283.

[18] Woodward, *Cottages and Farm Houses*, 21.

[19] *Barn Plans and Out-Buildings*, 152.

[20] *Barn Plans and Out-Buildings*, 187.

[21] *Barn Plans and Out-Buildings*, 193-194.

[22] Jacques, *The House*, 148.

[23] Allen, *Rural Architecture*, 263.

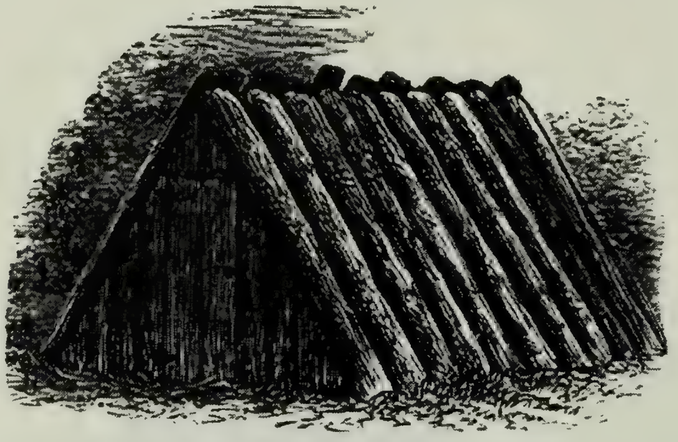

Fig. 146.—ICE HOUSE OF DONALD G. MITCHELL.

Figure 5.10 - "Fig. 146.—Ice House of Donald G. Mitchell." This example has massing characteristics similar to the superstructure of HS-4. (Reprinted from *Barn Plans and Out-Buildings*, (New York: Orange Judd Company, 1901), 146).

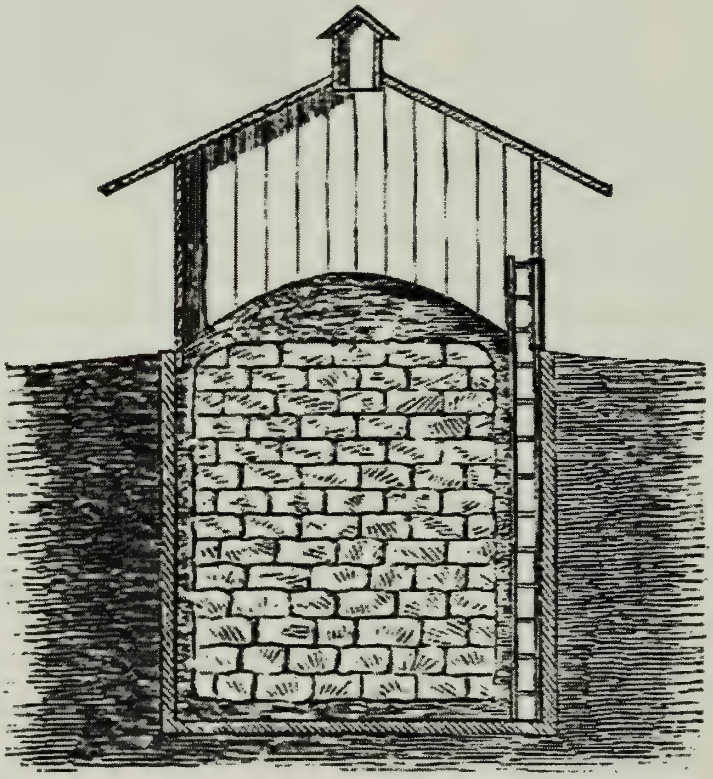

Fig. 150.—SECTION OF UNDERGROUND ICE HOUSE.

Figure 5.11 - "Fig. 150.—Section of Underground Ice House." (Reprinted from *Barn Plans and Out-Buildings*, (New York: Orange Judd Company, 1901), 150).

Figure 5.12 - "Fig. 159.—Another Ice House." An illustration of the building shown in plan in Figure 5.13. (Reprinted from *Barn Plans and Outbuildings*, (New York: Orange Judd Company, 1901), 157).

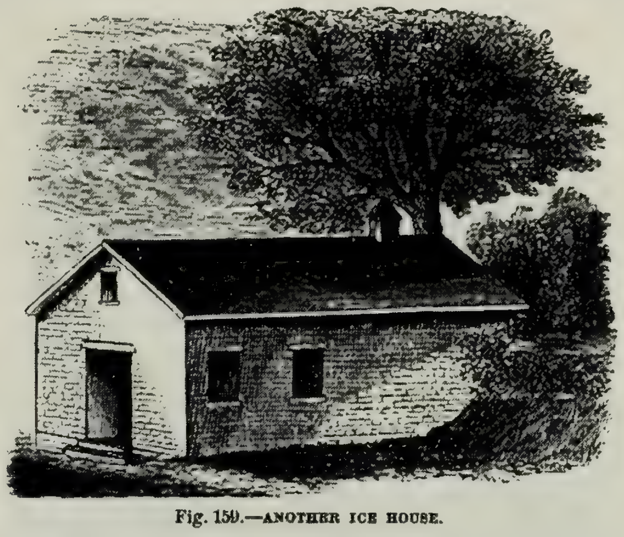

Fig. 159.—ANOTHER ICE HOUSE.

Figure 5.13 - "Fig. 158.—Ice House and Milk Room." A plan of an ice house and cooling room similar to HS-4. (Reprinted from *Barn Plans and Out-Buildings*, New York: Orange Judd Company, 1901), 156).

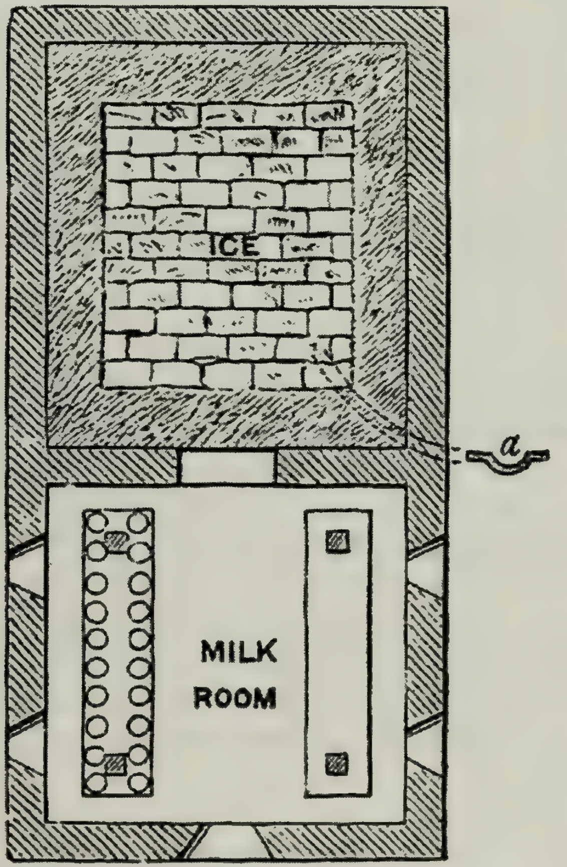

Fig. 158.—ICE HOUSE AND MILK ROOM.

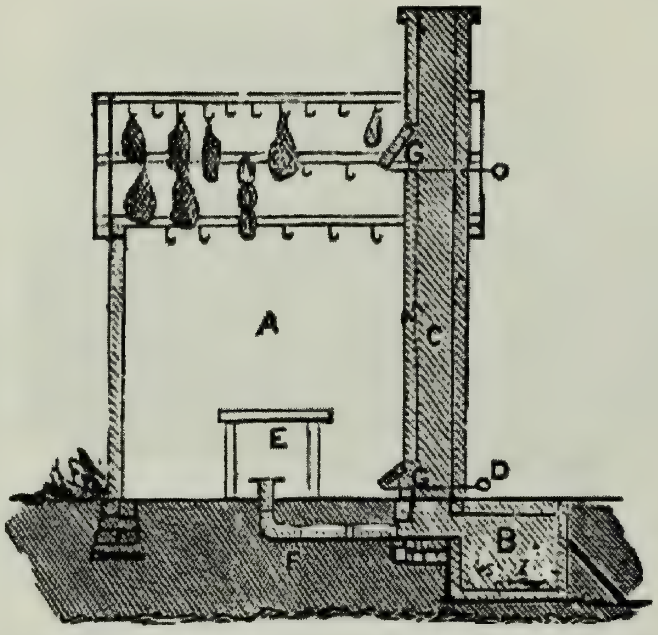

Fig. 192.—INTERIOR OF SMOKE HOUSE.

Figure 5.14 - "Fig. 192.—Interior of Smoke House." Notice the chimney valves at "G" which control smoke temperature and draft according to the author. (Reprinted from *Barn Plans and Out-Buildings*, (New York: Orange Judd Company, 1901), 188).

by a wall or partition which may have had a door opening placed in it to allow access between the two (Figures 5.12 and 5.13).

Smoke houses were not entirely different from ice houses in massing. It was very common for a smoke house to have just one room with a fire located at its center. Usually there was some kind of chimney stack or smoke vent at one end of the roof which was able to be tightly sealed when needed (Figure 5.14).[24]

Some smoke houses consisted of two rooms with one functioning as an ashery and the other acting as the meat storage room (Figures 5.8 and 5.15). The fire burned in the ashery and the smoke traveled to the storage room by way of vents, keeping the meat clean and uncooked. Sometimes, an economic way of building a smoke house was to combine an oven and smoke house, where the smoke from the oven was directed into the smoke house in the same way that smoke was directed from an ashery (Figure 5.16).[25]

The existing outbuilding has a configuration that is much like those shown in Figures 5.7 ("Fig.19"), 5.10 and 5.12. The door on the south gable end is above a pit where ice may have been stored (Figure 5.5). It is conceivable that ice was lowered into the room from the south door and stacked from the base of the floor to the top of the foundation wall as shown in Figure 5.11. Above the

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[24] *Barn Plans and Out-Buildings*, 187-188.

[25] *Barn Plans and Out-Buildings*, 198. Jacques, *The House*, 145-146.

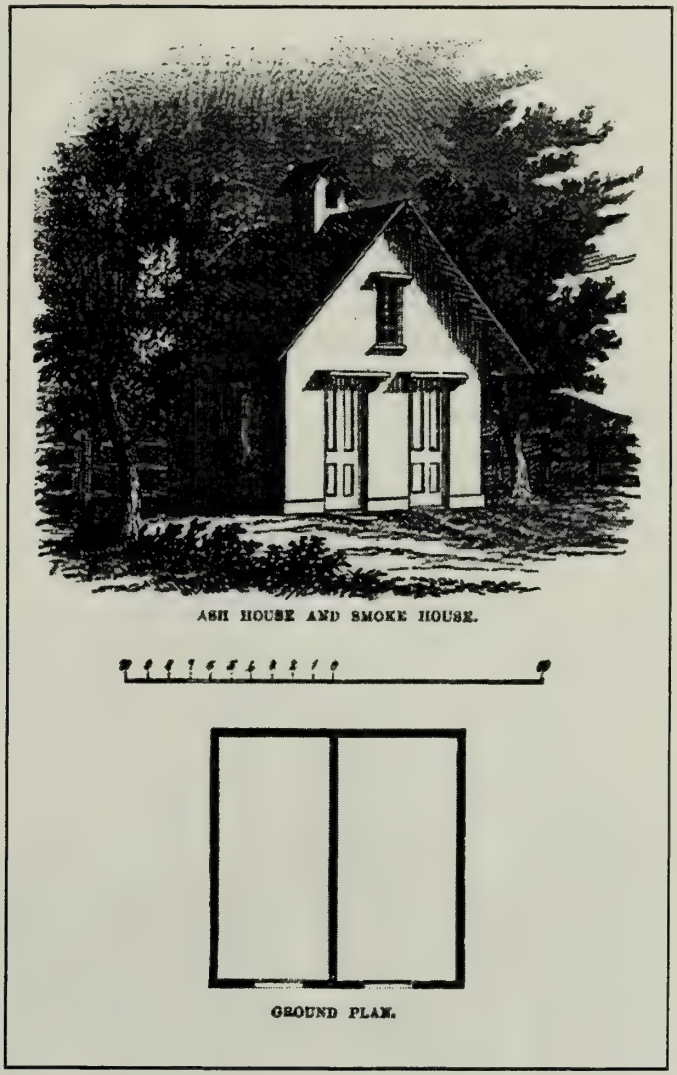
ASH HOUSE AND SMOKE HOUSE.
GROUND PLAN.

Figure 5.15 - "Ash House and Smoke House." Reprinted from Lewis F. Allen, *Rural Architecture*, (New York: Orange Judd, 1865), 265).

foundation walls, the space under the roof probably acted as a ventilation space with the warm air flowing out of the cupola at the center of the roof. The north room may have been a cooling room which was accessed by the door on the north elevation.

It is not likely, but possible, that one of the rooms could have functioned as an ashery when a portion of the building was adapted into a smoke house at some point in time. A small lean-to was added to the southwest corner of the structure sometime between 1875 and 1913. The lean-to shed roof, and what appears to be double "cellar doors," can be seen in Figure 5.4. This lean-to may have been constructed to act as an access way to a smoke pit, perhaps adapting the building for a use which it was not originally intended. If this is true, it could explain the presence of the unbarked sapling logs that span from the south foundation wall to the center partition. The logs, which exhibit only wire nails, may have suspended meat to be cured.

Materials

Generally, a simple ice house could be built cheaply of rough materials.[26] The walls and floors needed to be non-conductors of heat.[27] It was recommended that 4 inch by 6 inch posts of a lasting wood (oak or chestnut) be used if the structure was built above ground. A 6 inch square plate was set on top of the posts and then the inside and outside of each line of posts was planked or boarded up closely. The cavity between the planks was filled "with moist tan bark, or saw dust, well packed from the ground up to the plates." A space of 2 feet 6 inches to 3 feet was left in one side to form a door. When the house was filled with ice, boards were set up against the opening on the inside and outside of the door frame to form a continuous box. The cavity formed at the door was also filled with insulating materials.[28] For underground ice houses, the walls were often built of stone laid in mortar or cement up to a foot above the surface with the sill of the upper frame bedded in the stone work or cement. The posts, studs or rafters of the structure were framed into the sill. A ladder was built against the wall for convenience in putting in and taking out the ice. The ladder was covered by packing when the chamber was filled, but was exposed for use as the ice was removed.[29]

A good smoke house was built of brick, or stone. If built of wood, it was advised that the smoke house be plastered on the inside.[30] Some designers even recommended that masonry smoke

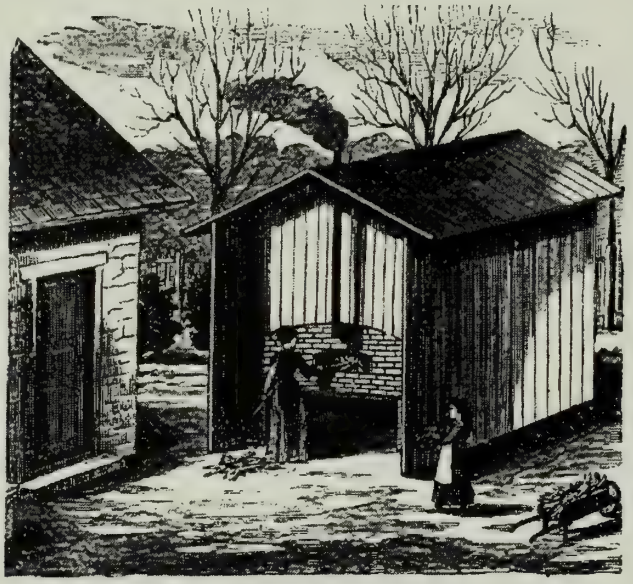
Fig. 204.—FRONT VIEW OF COMBINED OVEN AND SMOKE HOUSE.

Figure 5.16 - "Fig. 204.—Front View of Combined Oven and Smoke House." (Reprinted from *Barn Plans and Out-Buildings*, (New York: Orange Judd Company, 1901), 196).

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[26] Woodward, *Cottages and Farm* House, 76.

[27] Jacques, *The House*, 147.

[28] Allen, *Rural Architecture*, 261.

[29] *Barn Plans and Out-Buildings*, 151.

[30] *Barn Plans and Out-Buildings*, 187.

houses be lathed and plastered.[31] If it was feasible, an iron door was desired for the door opening to the structure's ash-pit, but an iron door would have been an extravagant expense for remote rural sites such as White Haven.[32]

The existing outbuilding is considered an underground structure because of the way it is placed in the landscape. Also, the materials which have been used in the building are indicative of an under ground structure. The foundation is stone, fully bedded in a sand and lime mortar. The top of the stone wall is about one foot and five feet above grade on the south and north elevation respectively.

The rafters have bird's mouths near the tails and rest on oak foundation sills. The foundation sill is not continuous on the east and west sides. There is a definite break in the west sill near the center wall. While the sill on the east side suffers from severe rotting and beetle damage, it appears that it too has a joint placed similarly to the west sill. Before the "attic" floor was added to the structure, access to the south room was gained by way of the south door and a sapling ladder which led down into the room.[33]

When described, the materials and systems that are extant in the existing structure are very similar to those prescribed for underground ice houses by nineteenth century designers. It is possible that the building could have originally been built to function as a smoke house, but the description of the existing structure matches that of an ice house more closely.

Ventilation

According to several nineteenth century sources, ventilation needed to be secured in all ice houses. A vented aperture, protected by a hood or a cap, was recommended to be placed at the peak of the roof.[34] If it was not feasible to vent the peak of the roof, it was permissible to put in a ventilation window, but no ventilation was permitted around the ice stack.[35] To preserve the ice, the only ventilation that was permitted in the ice house was a draft of air above the ice.[36] Spaces above the plates and between the rafters at the eaves permitted a constant current of air to pass over the upper packing, and remove the collected vapor by lifting the hot air out through the vent in the peak.[37]

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[31] Jacques, *The House*, 145.

[32] Jacques, *The House*, 145.

[33] Bill Wenzlick to the author, 12 March, 1992. Wenzlick said that "there were no stairs to the south basement but that most likely a ladder was used to get to the floor." Wenzlick remembers seeing a sapling-built ladder going down from the door to the floor, but he doubts that the ladder was original to the structure.

[34] *Barn Plans and Out-Buildings*, 143. Jacques, 149.

[35] Campbell, *Practical Cyclopaedia*, 282.

[36] Woodward, *Cottages and Farm Houses*, 22.

[37] *Barn Plans and Out-Buildings*, 143.

In the case of a smoke house, ventilation was minimal. All the parts of the building had to be kept as tight as possible so that the fire could not burn briskly. It was necessary for the fire to slowly smoulder and allow cool and acrid smoke to give flavor to the meat. By stifling the fire, the ashes did not rise with the smoke and the meat was not injured by excess heat.[38]

Before the addition of the floor to the existing structure, the area directly beneath the roof was open above both sides of the stone partition.[39] Physical evidence suggests that there was no soffit at the rafter tails before the floor addition, leaving spaces at the eaves for ventilation. The louvered cupola and the spaces between the rafter tails would have allowed air movement throughout the upper portion of the structure.

Comparing these features with that of the smoke house and ice house, the building, in all probability, could not have served efficiently or effectively as a smoke house. Rather, the features of the building compare favorably to those that were prescribed for a successful ice house.

It is possible that the cupola could have been used as a chimney for the structure, but there is no evidence of a flue ever existing in the cupola, implying that the building was not designed to be tightly shut as suggested. Another element which could distinguish the building as a smoke house, but is lacking in this structure, is the presence of creosote stains on the stone walls and the wood framing members.[40]

To summarize, the characteristics displayed in the subject structure, when compared with various farm building types, have more in common with an ice house than any other building type. Judging the parameters given by nineteenth century designers, the existing structure would have functioned proficiently as an ice house rather than a smoke house. Although the likelihood of the building being used for a function which it was not originally intended is high. Buildings were frequently made to fill dual roles or "reused" to fit the next tenant's needs. It must also be pointed out that according to the 1840 painting (Figure 5.1), the superstructure was much different from the one that now exists. Therefore, it cannot be assumed that this building functioned as an ice house from its initial construction until modifications prior to 1875.

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[38] *Barn Plans and Out-Buildings*, 187-188 and 191.

[39] Bill Wenzlick to the author, 12 March, 1992. Wenzlick said that he remembered the stone wall at the center of the building as a partition and that from the south door you could see the north gable end.

[40] *Barn Plans and Out-Buildings*, 187. "The object [of the smoke house] is to be able to expose meats to the action of creosote and the empyreumatic vapors resulting from the imperfect combustion of wood, etc."

MATERIALS ANALYSIS

Paint

Paint analysis was performed on exterior painted surface of the Ice House in 1992 by Washington University Technical Associates (WUTA). The purpose of the analysis was to determine historic colors applied to the frame portion of the building.

Mortar

Three mortar samples were collected from the Ice House in 1992 and analyzed by David Arbogast, Architectural Conservator, Iowa City, Iowa. The purpose of this analysis was to determine the original composition of the mortar found in the structure which is important for the proper mortar mix to be used in repointing and reconstructing stone walls. Two of the samples, taken from opposite sides of the central wall, were found to have a mixture of approximately three parts of sand to each part of lime. The third sample, taken from the west wall of the south room, was found to contain approximately four parts of sand to each part of lime. When comparing the mortar samples taken from the various buildings on the site, it was found that the samples taken from the Ice House foundation consisted of a mix similar to that of the Stone Building but not to the Main House (refer to Division II & III, Materials Analysis). This finding leads to the assumption that the same person that built the Stone Building may have built the Ice House since both use a common lime/sand mix as opposed to the lime dirt mix that is found in the Main House.

Wood

Four wood samples were taken from a rafter, a floor board and the south door in the Ice House in 1992. The samples were analyzed by Forest Products Laboratory, Madison, Wisconsin, for the purpose of determining the wood groups used in the building important for structural loading analysis. The floor board and rafter were found to be of white pine while the door rail and panel are of yellow pine.

Asbestos

In 1991, the St. Louis firm, ATC Environmental Inc. was contracted by the National Park Service to survey the extent of asbestos bearing materials at the site. The firm found the Ice House to possess asbestos-cement shingles which contained 35 percent chrysotile.[41] A large pile of the same shingles were found stored on the upper floor level of the building. The asbestos cement shingles were removed and replaced with temporary asphalt strip shingles in 1993.

ARCHEOLOGICAL CONSIDERATIONS

Archeological excavations have not yet been performed within or around the Ice House. When an excavation is conducted, it will be important to look for various elements that will give definite clues to the original function of the building.

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[41] ATC, 4.

Archeological elements which are common to an ice house are as follows:

- Dry, gravelly, or sandy soil allows for perfect drainage of the ice. If this is not the case and the soil is clay, the floor base may have been filled with small blocks of wood, round stones, broken bricks, broken stones, coarse gravel, or clean sharp sand.[42] It is also possible that the bottom was made up of layers of large stones with smaller stones and coarse gravel placed upon them to make a level surface on which was sometimes placed a plank floor.[43]

- A piece of lead drain pipe, bent or trapped in an s-shape, was used to carry off all water from the melted ice in some ice houses.[44]

- Sawdust, spent tan (tree bark), charcoal powder from charcoal pits or store houses ("braize"), chaff (oat, wheat or buckwheat), or marsh hay were all packing elements that used to insulate ice.[45] These elements might be found at the interior perimeter of the ice house walls and across the entire floor.

There may be specific archeological elements found in a smoke house which are common to all smoke houses:

- The fire was generally placed on a stone slab in the middle of the floor in a common smoke house. If this was not the case, a one foot deep fire pit was dug in the ground to contain the fire.[46]

- In the case of a smoke house built of wood, plaster was sometimes applied to the interior walls.[47] Plaster and lath were also recommended as a ceiling covering, presumably to aid in sealing the building and also for fire protection.[48] In the event that plaster and lath were removed from the structure's walls or ceiling at some point in time, it would be wise to look for remnants of plaster when excavating.

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[42] *Barn Plans and Out-buildings*, 141.

[43] *Barn Plans and Out-Buildings*, 149. Campbell, *Practical Cyclopædia*, 282.

[44] Allen, *Rural Architecture*, 262. *Barn Plans and Out-Buildings*, 155-157. Thomas Moore, *An essay on the most eligible construction of ice-houses*, (Baltimore: Bonsal & Niles, 1803), 1-13. Woodward, *Cottages and Farm Houses*, 21-22.

[45] Allen, *Rural Architecture*, 261. *Barn Plans and Out-Buildings*, 141-143, 162. Campbell, *Practical Cyclopaedia*, 282. Woodward, *Cottages and Farm Houses*, 22. Edward Richard Jones, M.S., *Farm Structures*, (Madison, Wisconsin: Published by the Author, College of Agriculture, 1933), 107.

[46] *Barn Plans and Out-Buildings*, 187.

[47] *Barn plans and Out-Buildings*, 187.

[48] Jacques, *The House*, 145.

♦ If the building was used as a smokehouse, it is logical that the butchering process could have taken place around the exterior of the building. If that was the case, a large amount of bones may be found surrounding the building. Discovery of bones may not be helpful in determining if the building was a smoke house because it is known that the last tenants used the ground to the west of the structure as a dump area.

SITE CONTEXT

Grade and Drainage

The surrounding grade is relatively steep, uniformly sloping down five feet from the south side to the north side of the foundation (see 1992 HABS drawing). Surface drainage runs directly to a creek at the base of the hill.

Vegetation

A variety of small to large bushes and trees engulf the perimeter of the building (Figure 5.17). There are many walnut trees in the vicinity of the Ice House, one of which was removed in September of 1992 due to the root damage it was inflicting on the foundation of the structure. Ivy also grows in the area and creeps up the stone walls. Until 1940 there was little vegetation growing around the building except for two large trees which grew against the west wall of the foundation and caused severe root damage to that wall.

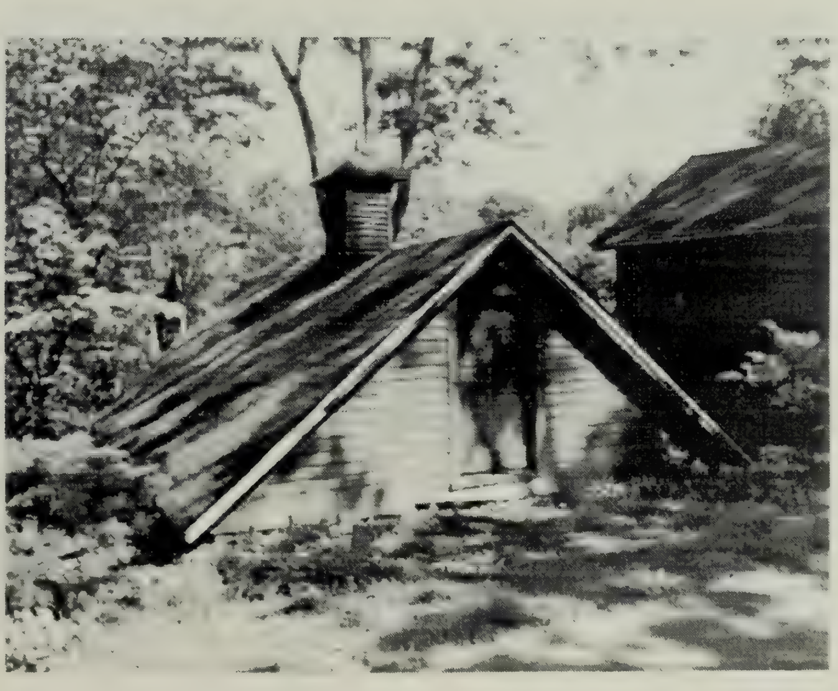

Figure 5.17 - View of the Ice House from the southwest, 1994. Pressure form surrounding trees and soil has partially collapsed the foundation. Much of the vegetation surrounding the structure has been removed. (Photograph by Alan O'Bright, ULSG collections).

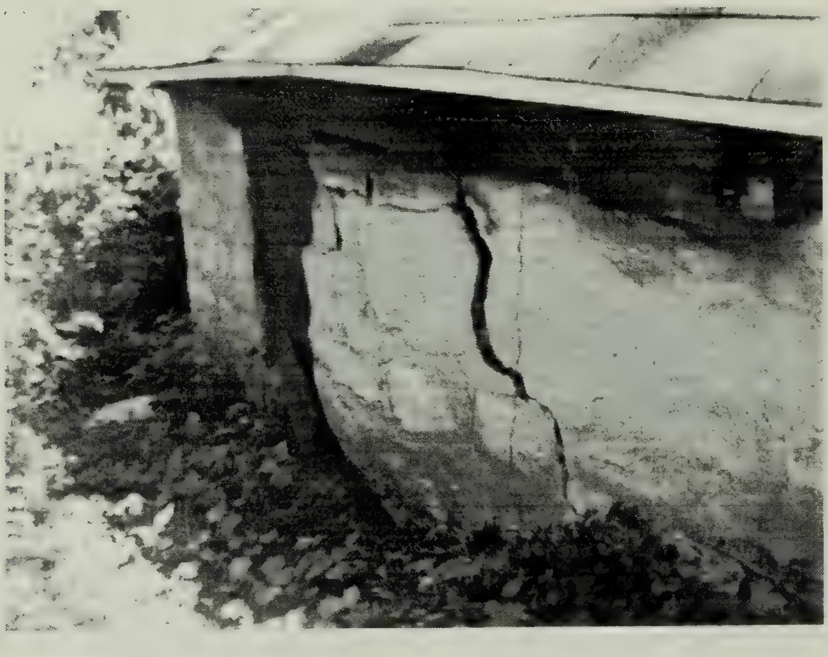

Figure 5.18 - View of the west foundation wall of the Ice House, 1994. Note the severe crack and bulging in the wall surface. (Photograph by Alan O'Bright, ULSG collections).

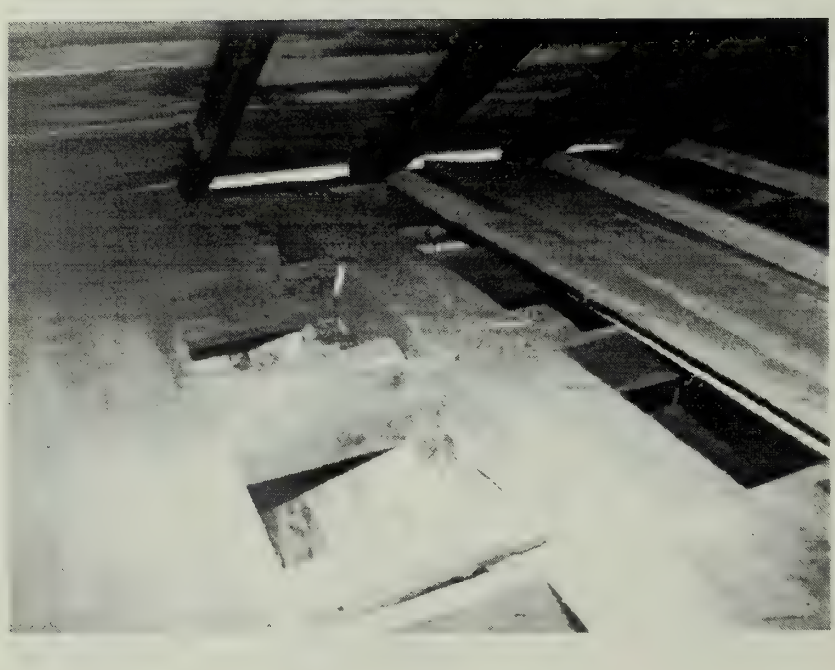

Figure 5.19 - Foundation sill at the interior partition, 1994. The dimensioned floor joists were installed in the 1960s. Unbarked poles to the left of the sill may have been installed by the Wenzlick family to hang meet when they used that structure as a smoke house. The sill is rotted internally. (Photograph by Alan O'Bright, ULSG collections).

FABRIC SURVEY

Foundation System

In the Ice House, 20 inch to 21 inch thick rubble limestone foundation walls are bedded full in sand and lime mortar. The perimeter measures approximately 22 feet 5 inches by 18 feet; an exact measurement is difficult because the foundations are deteriorated. There is a continuous 24 inch thick stone partition that divides the interior into two equally sized rooms. The north portion of the building is mostly above ground, while the south portion is mainly below the ground's surface (see 1992 HABS drawing). It is unknown if footings exist.

Historic photographs (Figures 5.4 and 5.6) and existing mortar joints shows that there have been several repointing jobs performed on the structure. The most recent repointing was done with a gray portland cement mix. The perimeter walls are suffering from earth movement and tree root damage with the south and west walls suffering the most (Figure 5.18). A portion of the south wall's interior stone veneer has collapsed and the west wall has a large hole in it due to tree root damage. The central wall has a minute amount of large rodent damage and is in very good condition. The hewn foundation sills are in poor condition because of insect damage, water damage and rot.

Structural Framing Systems

The building's light wood framed gable roof reaches 9 feet above grade at the south elevation and 15 feet at the north side. The frame rests on a discontinuous hewn timber sill which is set upon the foundation walls (see Foundation System). There is also a hewn foundation sill at the top of the interior stone wall (Figure 5.19). This sill has mortise pockets which may date to the installation of the sill. The foundation sills are extremely deteriorated. The existing framed floor will support 40 pounds per square foot live load.[49]

The 2 inch by 6 inch circular and vertical-sawn white pine rafters are fastened with cut nails.[50] The existing roof structure will support a code specified snow load of 20 pounds per square foot provided that repairs are made.[51] Some of the rafters are deteriorated from insect and fungal attack where they are in direct contact with the foundation sills. The roof has shifted and spread away from the foundation due to removal of the collar ties and absence of adequate of lateral restraint at the sills.

The studs in the gable ends range in size from 1 inch by 4 inch to 2¼ inch by 4½ inch boards and are believed to be original to the construction of the superstructure. The wall framing is in fair to good condition.

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[49] HA, *Structural*, 33.

[50] Alden, sample W-OBA-48.

[51] HA, *Structural*, 33.

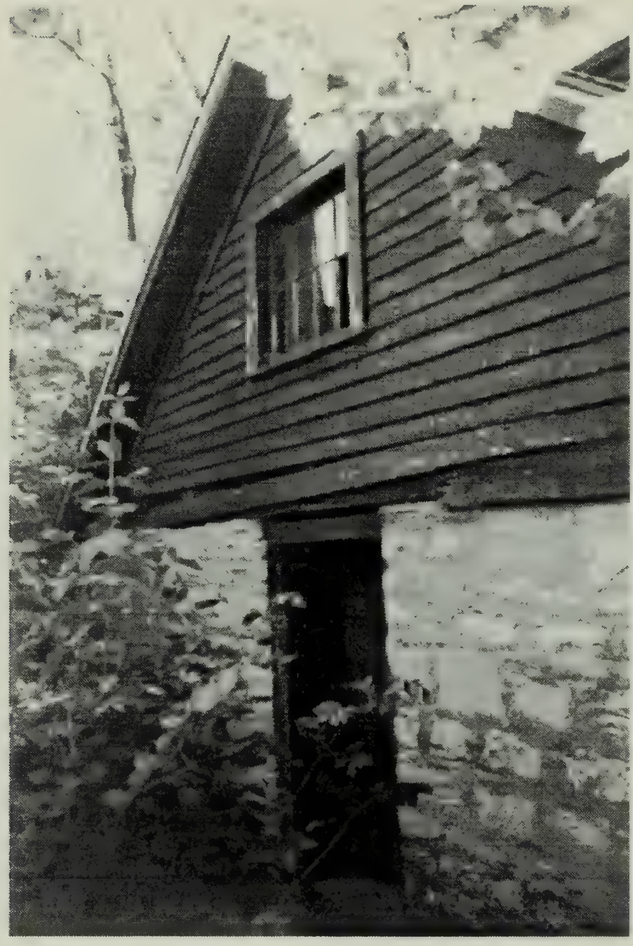

Figure 5.20 - North elevation of the Ice House, 1994. The gable-end window was installed during the 1960s, and is believed to have been salvaged from the Barn (HS-3). Siding near the foundation is in poor condition. (Photograph by Alan O'Bright, ULSG collections).

Exterior Cladding System

The gable ends are sheathed in 5⅝ inch circular-sawn beveled clapboard siding with an exposure of 3½ inches to 4½ inches. It is believed that these clapboards are original to the more recent superstructure and have only been altered when a window opening was cut in the north gable end (Figures 5.20). The boards are in good condition overall. The exterior was last painted red during the late 1980s.[52]

Floor System

A white pine floor, accessible through the south door, is set on top of the hewn timber sills and contemporary 2 inch by 8 inch joists.[53] This existing floor surface was added to the structure in the early 1960s, separating the rafter area from the "basement." Wenzlick remembers installing the 2 inch by 8 inch joists for the new floor but indicated that he did not cut the mortise pockets in the central sill.[54] The floor boards have random widths and were salvaged from demolition of portions of the barn. The boards are in fair condition. While the ground floor in the north room is a combination of flat stones and dirt, it is difficult to be sure of the floor base in the south room as the surface is concealed by rubble (see 1992 HABS drawing). Entry to the north room is gained through the north door while the south room has been sealed by the floor above. A 1 foot 8 inch wide by 9 inch high break on the west elevation, thought to have been caused by tree roots, is presently the only way to enter the south room until the floor above is removed (see 1992 HABS drawing).[55]

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[52] Grant L. Mugge to Alan O'Bright, 10 January, 1995. St. Louis County spray painted the structure.

[53] Alden, sample W-OBAF-49.

Roof System

In 1913 the roof was protected with wood shingles, but by 1940, roll roofing was apparently the only roof covering (Figures 5.4 through 5.6). Presently, the roof system consists of asbestos cement shingles laid over roll roofing and random width, 1⅛ inch thick board sheathing fastened to 2 inch by 6 inch rafters. The sheathing and rafters are comprised of circular-sawn and vertical sawn white pine boards.[56] It is assumed that most of the sheathing boards may be original to the present structure because of the many cut nails found in them. One sheathing board which lays at the ridge of the southwest roof face is definitely known to be a recent replacement board because of its light color and the wire nails which are found in the board. Cut nails fasten the rafters at the ridge indicating that the members are not recent construction. Soffit boards are nailed directly to the bottom of the east and the west rafter tails and both sides have a fascia; although, the fascia boards are not all alike. The fascia on the east side consists of three boards; the south board measures 1⅛ inches by 5¾ inches, the middle board which bears a beaded edge measures 1 inch by 6½ inches, and the north board measures ¾ inch by 6¼ inch. The west fascia consists of two beaded boards which measure ½ inch by 3¼ inch. The soffit boards are in fair condition where they are still in place. The fascia boards are not original to the eaves and are in poor condition.

Cupola

A 2 foot wide by 2 foot 6 inch deep by 4 foot 6 inch high louvered cupola with pyramidal roof surmounted by a finial is placed at the center of the building's gable roof (Figure 5.21). The cupola's four vertical structural supports appear to be original to the structure. The southeast, southwest, and northwest supports measure 2⅝ inches by 2⅞ inches, with the northeast support being smaller at 2⅜ inches by 2¾ inches. These supports are nailed to the center rafters with three button-head cut nails. Each support is notched 1⅛ inches to allow for a ledge that rests on top of the rafters giving more stability to the cupola. The posts are in good condition. At one time, collar-ties were in place to give the center rafters added strength for supporting the cupola. However, these were removed sometime after 1940 causing the roof to severely deflect. There is evidence that another collar-tie, which may have been added at a later date, existed at the third rafter from the south gable end, but this one has also been removed.

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[54] Bill Wenzlick to the author, 10 May, 1993. Wenzlick indicated that he knows that there were pockets in the sill prior to his installing the present floor, but that the pockets did not accommodate any joists prior to his installation of the existing joists.

[55] For safety purposes, this break should not be used as an entrance to the south room.

[56] Alden, sample W-OBA-48.

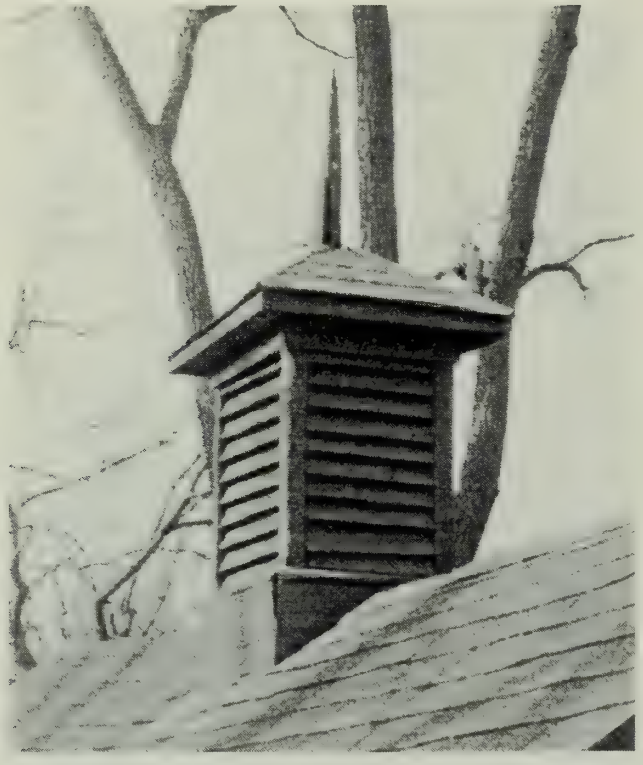


Figure 5.21 - Ice House cupola viewed from the southwest, 1992. The cupola is in poor condition. (Photograph by Kristen Marolf, ULSG collections).

All of the material that exists above the cupola supports appears to have been added more recently. Inspection of historic photos reveals that the louvers have been replaced before (Figures 5.4 and 5.6). Presently these elements are again in need of replacement because of the damage they have sustained from squirrels and insects. The cupola roof seems to be in fair to good condition and the finial is in poor condition because it has sustained insect damage.

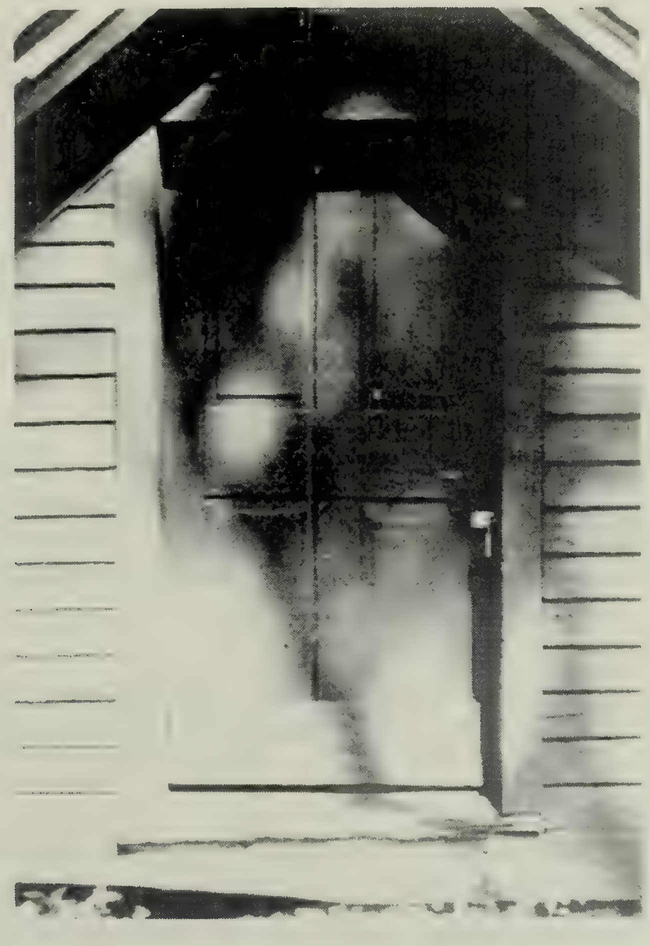
Doors

Centered in the gable end of the south elevation and in the north elevation's stone wall are two doors which allow access to each of the structure's two levels. The door that is now on the north side of the Ice House may not be original to the building. In a 1913 Wenzlick photo (Figure 5.4) and a 1940 HABS photo (Figure 5.6) the door appears to be a diagonally braced batten door comprised of planks. The present door is an unbraced batten door consisting of three wide vertical planks and two horizontal planks. The south door is currently a four panel door believed to have been salvaged from the early portion of the Main House (Figure 5.22) The type of door that preceded the current door is unknown. The existing door is in poor condition; a large portion of the bottom rail was cut down to fit the opening. The door should be salvaged however.

Windows

The openings located in the west and east stone walls of the north room are believed to be original to the erection of the stone foundation. The lintel over the east opening is still in place and consists of two unfixed boards measuring 3 inches by 5 inches while the west opening's lintel has been laid on its side above the opening. At present, the openings are boarded up with inch thick boards. Upon

Figure 5.22 - South Ice House door, 1994. It is believed that this panel door was salvaged from the Main House. (Photograph by Alan O'Bright, ULSG collections).



inspection, it appears that no sashes and/or shutters were ever extant at either opening. Window stops or "shadows" of them are visible and it seems that the openings may have originally been filled with fixed glass between the stops. At this time, the window jambs, sills and heads are in very poor condition.

The third window is set into the north gable end. The eight light (four-over-four) window was added in the early 1960s, and measures 32 inches by 32¼ inches. This window may have been salvaged from the west wall of the Barn during or soon after its move in 1962. The sash dimensions are identical to the existing west elevation Barn window openings now concealed with plywood at the exterior.

DOCUMENTATION DRAWINGS

No drawings have been found for the Ice House that predate the 1992 HABS drawing sheet for the building (see Appendix I - Previous Drawings and Sketches). A single sheet of preliminary structural drawings (NPS 357/80011) was prepared in 1994.

PART 2: TREATMENT AND USE

ULTIMATE USE AND TREATMENT RECOMMENDATIONS

The 1875 Frank Leslie lithograph of "Missouri-President Grant's Farm near St. Louis" confirms that the Ice House was in place during the time that Grant owned White Haven. It is likely, but not certain, that the building was constructed sometime during Dent occupation of the site (possibly at the same time the Stone Building was built) and may have continued to function as an ice house when Grant came to White Haven. The building was converted to a smoke house/ice house during the mid to late nineteenth century.

It is recommended that the Ice House be restored to a middle to latter nineteenth century appearance to provide visitors with a sense of period ice storage and food preservation practices. The outward appearance of the Ice House has changed very little since 1875 and should therefore continue to retain that appearance. It is recommended that the interior, which was modified in the early 1960s by the last owner, be returned to its previous form for interpretation of its function as an ice house.

To ensure prolonged preservation of historic fabric, the ensuing comments will address treatment and removal recommendations specific to existing building systems and elements.

Site

Remove trees and vegetation that may undermined the foundation and damage the roof structure. Excavate a 4 foot wide trench around the perimeter of the foundation to repair the foundation and install a drainage system. Backfill and regrade the soil surrounding the structure, sloping the grade away from the structure at the south elevation. Archeological investigations should be initiated prior to any ground disturbance.

Foundation

Most of the perimeter limestone foundation walls have been extensively damaged by soil movement and tree root damage. Therefore, the deteriorated perimeter walls should be carefully dismantled and any Portland cement-bearing mortar remaining on the stone should be removed if possible. Archeological work should be completed at the interior and exterior perimeter prior to any excavation work. The interior limestone partition is in good condition and should be retained. The dismantled portions should be rebuilt using the existing stones as much as possible. New reinforced concrete footings should be placed beneath the rebuilt walls. Vertical reinforcing should be placed in the walls to resist soil pressure and seismic activity. The new work should be bedded with Portland cement based mortar and pointed with sand/lime mortar matching the color of the existing mortar. The stronger bed mortar mix will assist the walls in resisting soil pressure. The intact partition need only be repointed. New mortar should match the appearance, color and relative strength of historic bed mortar.

Installation of a perimeter drainage system is strongly recommended to relieve water pressure on the rebuilt foundation walls. Bentonite waterproofing should be installed on the foundation walls while they are exposed during installation of the drainage system.

Floor Structural Systems

The ground floor in the Ice House consists of dirt and stones and should remain as such unless archeological excavations determine differently. The existing wood frame floor should be removed to expose the lower chambers as the building appeared prior to the 1960s. Visitors would have an opportunity to view nineteenth century ice storage and cooling practices.

Roof Systems

All existing foundation sills are too deteriorated to be serviceable and will have to be replaced. It is recommended that the size, tool marks, and mortise pockets be replicated as closely as possible to the existing. The exception is that the south and north wall sills will have to be sized larger than the existing to accommodate lateral loading requirements.

After the removal of the collar ties in the early 1960s, the rafters spread out from the dead load of the roof, causing the ridge to deflect. The rafters should be repaired and brought back to their original position and collar-ties should be installed. The cupola's louvers and finial, along with any members suffering from insect or rodent damage, should be repaired or replaced.

Where sheathing is deteriorated beyond serviceable use it should be replaced with similarly sized boards. New wood shingles should be pressure treated with at least a Class C fire retardant and should be installed directly over the board sheathing.

Exterior Cladding, Trim, and Finishes

Replacement or infill cladding shall match adjacent cladding as close as possible. The ¾ inch by 2⅜ inch trim boards nailed to the rake facias should be removed as these were added sometime after 1940. The eave and rake fascia boards should be replaced with 1 inch by 5 inch boards.

It is recommended that all existing painted exterior surfaces which are to remain in place, be stripped of lead bearing paint. Removing all lead-bearing paint will preclude the necessity of enclosing the structure to prevent the escape of lead particles into the air or ground during future paint preparation or repair work.

It is recommended that the brown red color found in Layer 2 of the paint analysis (Munsell 7.5YR 3/4) be used for the exterior paint finish. The cream found in Layer 1 may have been a primer coat (see *Appendix D - Paint Analysis*).

The exterior paint color chosen for repainting the building should be selected from the colors that have been verified in the paint analysis. The existing color may be the appropriate paint color to use.

Doors

The existing south door was salvaged from the Main House and modified to fit the door opening. This door should be removed, placed into the park curatorial collection, and replaced by a new panel door. The north door is in good condition and only need be repainted.

Windows

The window located in the north gable end was added in the 1960s. This window should be removed and the opening infilled with clapboard to retain the appearance seen Figure 5.6.

Presently, the window openings in the foundation walls are boarded up. It is known that there have been boards on these openings since at least 1913 (Figure 5.4). Cut nails found in the extant jambs indicate that the members are not recent additions to the structure. It is evident that a glass plate must have been set between the stops in the jamb but it is not known when they were removed. It is recommended that the jambs be salvaged if possible or rebuilt to match the existing members. Glass plates may be set in the rehabilitated jambs if desired. If the decision is made to board up the openings again, it should be noted that rodents may establish nests between the boards as they have done in the past.

Shutters

At this point in time there is no evidence that there have ever been any shutters covering the window openings in the foundation walls. If, through further inspection or new information, there are indications of shutters having been present at one time, it may be desirable to construct new batten shutters as replacements. These shutters should be operable to allow the north room to be ventilated and to receive light.

Accessibility

Any trail access to the north portion of the Ice House should be in compliance with the Uniform Federal Accessibility Standards (UFAS). A grade ramp should be constructed at the south door and a strong barrier placed at the closed side of both the south and north door to allow safe observation of the building's interior. Railings need to be provided along inclines as required by the UFAS. Use of stairs in the trail should be avoided if possible.

Electrical System

An electrical system is not required for this structure. However, if exhibit or general lighting is desired, underground power can be provided to the structure from the Main House at any time.

Cost Estimate

Ice House (HS-4)

Ulysses S. Grant NHS

The following table summarizes Class C cost estimates associated with the restoration and preservation of the Ice House. All work is assumed to be accomplished by contract labor. These estimates reflect 1995 costs for completion of the proposed alternative. If implementation of a proposed treatment is delayed, it is recommended that the following figures be reviewed and revised to include adjustments for inflation of materials and services.

Category	Description	Cost
Site	foundation excavation, grading, walks	$4,300.00
Structure	Shore roof structure, record and mark foundation, demolish foundation, clean mortar from stone, rebuild, foundation, repointing, seismic reinforcement, waterproofing, perimeter drainage, backfill	$67,900.00
Exterior	Repair roof, repair cupola, surface preparation and painting	$9,300.00
Doors & Windows	Reconstruct new door and windows, repair existing door	$4,600.00
Interior Finishes	Remove wood floor and joists, replace collar ties	$900.00
	Subtotal	$87,000.00
General Conditions	Insurance, temporary utilities, mobilization, equipment (10%)	$8,700.00
	Subtotal	$95,700.00
	Profit and Overhead (15%)	$14,355.00
	Subtotal	$110,055.00
	Contingency (10%)	$11,005.50
	Total (Construction)	$121,060.50
A/E Title II	Structural, mechanical, and electrical construction documents	$5,220.00
WASO Contingency	(31%)	$37,528.76
Archeology	Archeological mitigation	$25,000.00
	Total (Construction, Design, Inspection, Archeology)	$188,809.26

DIVISION VI - CHICKEN HOUSE (HS-5)

INTRODUCTION

The Chicken House is located about 50 feet northwest of the Stone Building (HS-2) and 10 feet northeast of the Ice House (HS-4) and is known to have been located there since at least 1913. Although it may have originally been erected at a different site, it is believed that the structure was constructed during the latter half of the nineteenth century; therefore, making construction during Grant's ownership of White Haven possible. The structure most likely functioned as a poultry house initially, but was altered later for use as a workshop and storage shed.

The structural integrity of the Chicken House is fair to good. It appears that the building has a endured few changes including removal of partitions, replacement of floor boards, widening of the door, in-fill of a fowl door, and the installation of a "doggie door" in the west wall. At present, the structure is used as storage for salvaged lumber building millwork and may serve as a storage shed or an interpretive piece in its future with the National Park Service.

PART 1: DEVELOPMENTAL HISTORY

HISTORIC PHOTOGRAPHS AND ILLUSTRATIONS

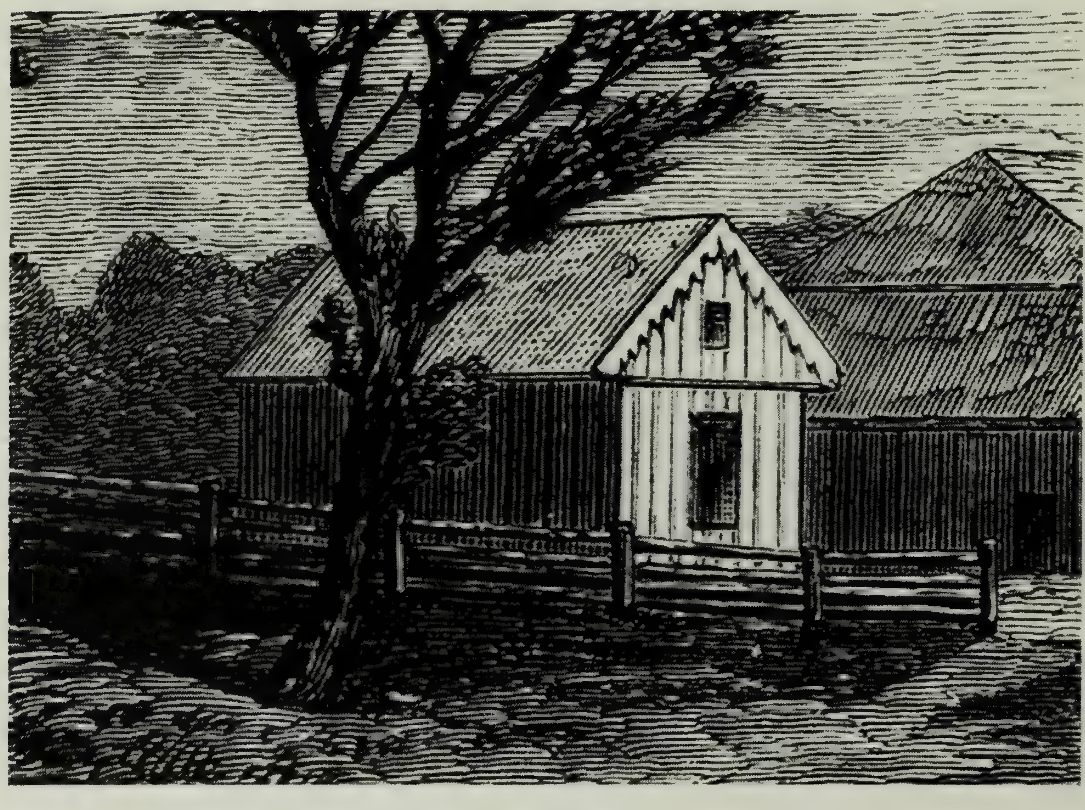


Figure 6.1 - "Missouri-President Grant's Farm Near St. Louis." Enlarged detail of a small outbuilding that stood near the present Cottage structure. There is a possibility that the building represented by this image may be the present Chicken House. The building in this illustration was located on, or near, where the present Cottage now stands. (Engraving from sketch by William Staengel, *Frank Leslie's Illustrated Newpaper*, (October 16, 1875), 93, ULSG collections).

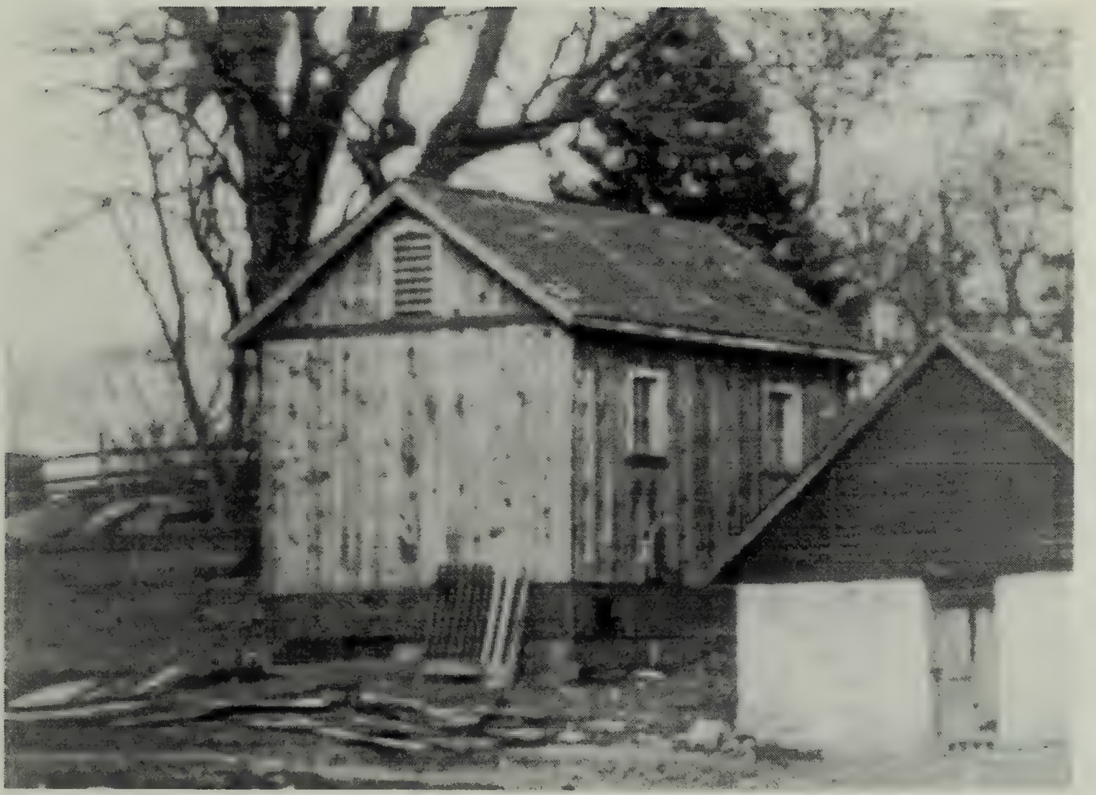


Figure 6.2 - View of the Chicken House from the northwest, 1913. This is the earliest known photograph of the structure. (Enlarged detail of photograph from the personal collection of Bill Wenzlick. See Figure 2.12).

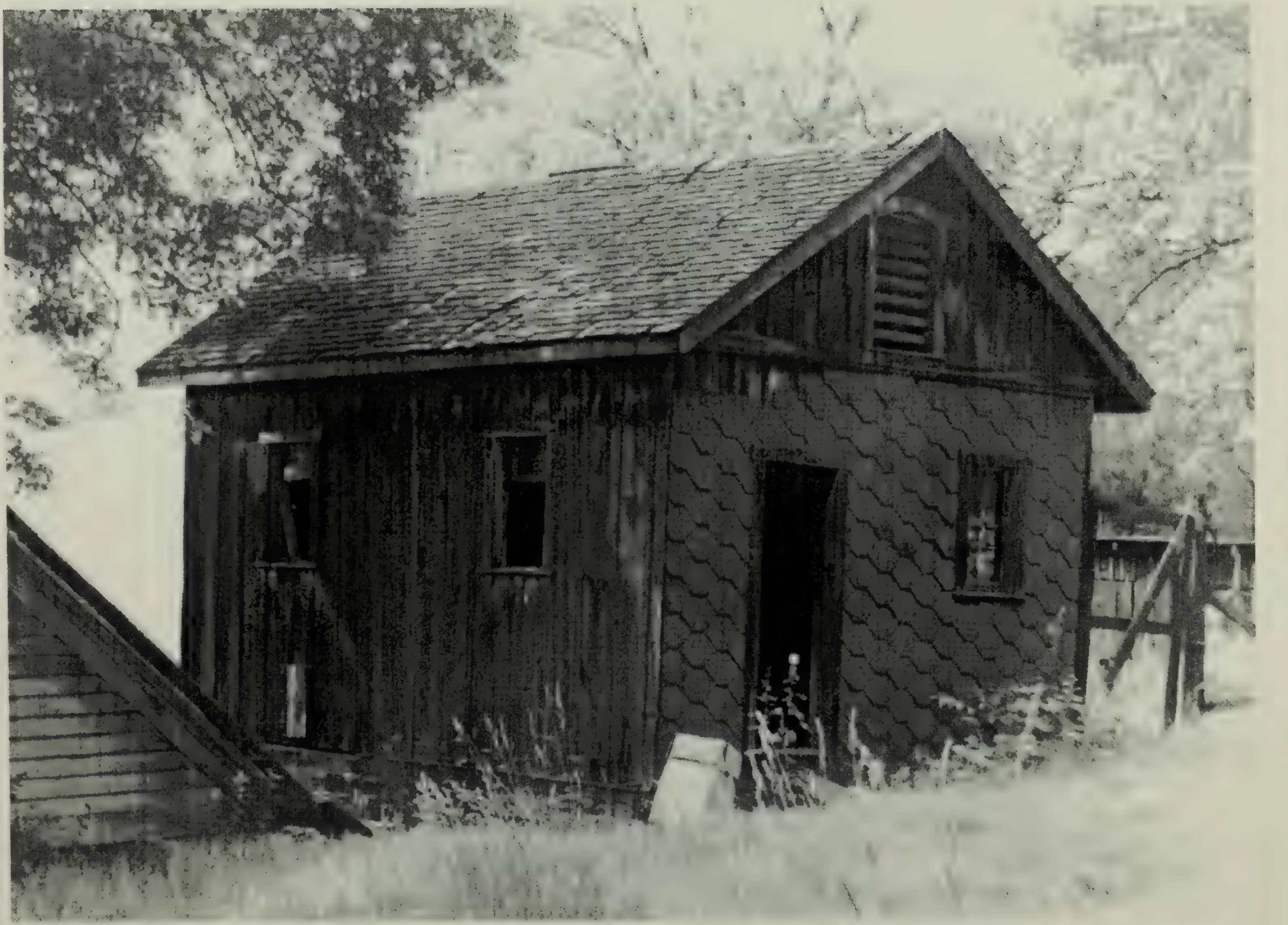


Figure 6.3 - View of the Chicken House from the southwest, 27 July, 1940. Notice the off-center door and window on the south elevation in comparison with the centered door with no window in Figure 6.1. (Lester Jones, photographer. Enlarged detail from photograph in HABS collections, 112179-HABS MO., 95-AFT, v. 1B-1).

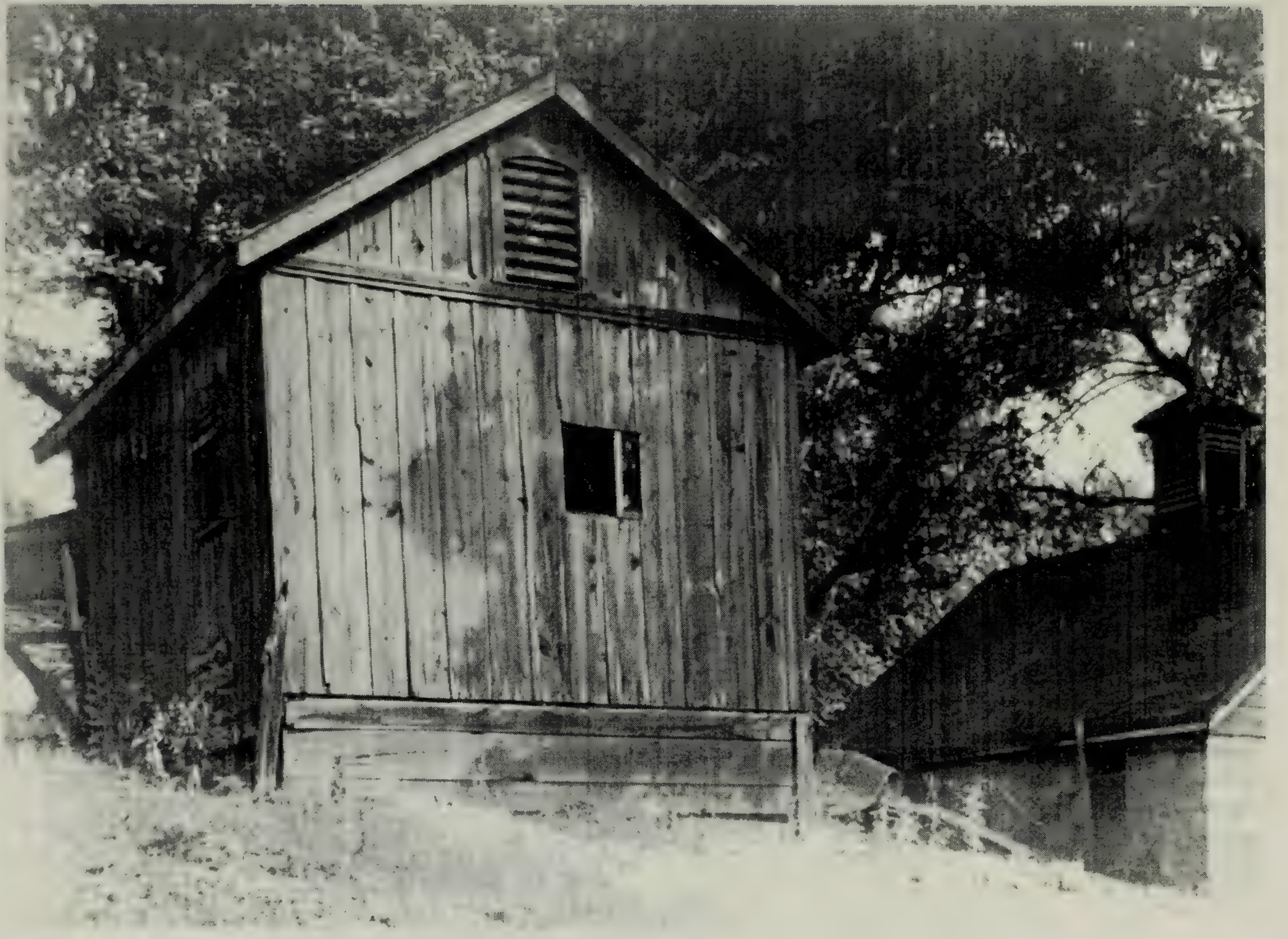


Figure 6.4 - View of the Chicken House from the northeast, 27 July, 1940. (Lester Jones, photographer. Enlarged detail of photograph in HABS collection, 112179-HABS MO., 95-AFT, v. 1B-2).

ARCHITECTURAL ANALYSIS

The Chicken House is thought to have been constructed by 1870 because of the cut nails that were used in its construction.[1] There is a possibility that it was built elsewhere on the site, or even adjacent property, and moved to its present location. In an 1875 lithograph, the smaller building located near the cow barn exhibits characteristics similar to the Chicken House. Differences in 1875 shed drawing, when compared to early twentieth century photographs of the structure, raise questions as to whether the same structure is featured (Figures 6.1, 6.3, 6.4 and 6.5).

From photographic evidence, it is established that the Chicken House has been at its present location since 1913 (Figure 6.2). Judging from the photographs, the function of the structure cannot be determined. Accounts by people who lived on the site between 1913 and 1940 are not conclusive nor consistent with one-another, leaving some doubt as to the function of the building.[2] Before that time, the structure could have solely performed as a chicken house. No one knows for sure, but there is an indication that there had to have been a chicken house in the vicinity of Hardscrabble and White Haven in 1868 when Grant wrote his farm caretaker William Elrod "...I intend for your salary for this year to be $500 00 besides what Sarah Ellen and the children can make off of chickens?"[3]

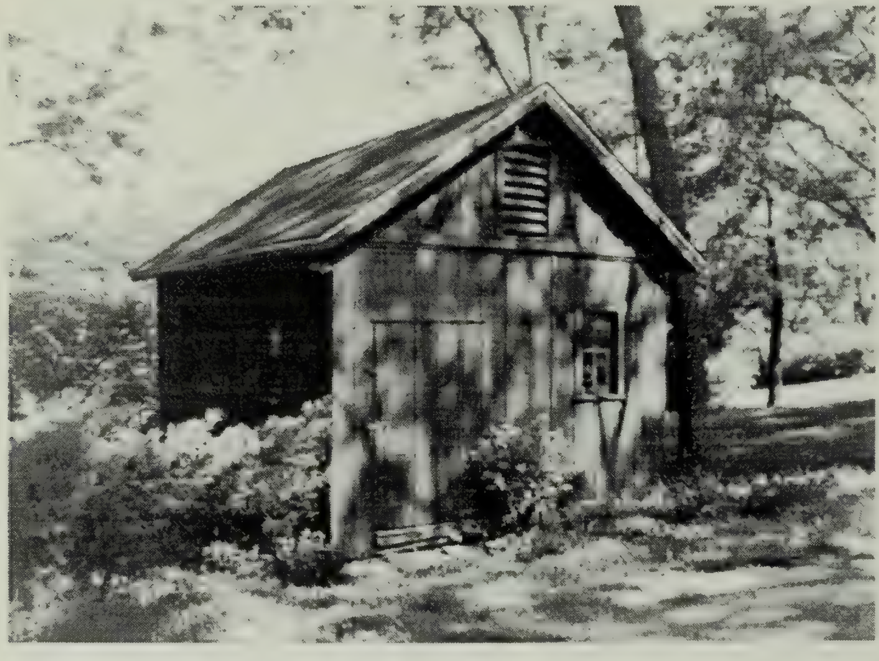


Figure 6.5 - View of the Chicken House from the southwest, 1994. (Photograph by Alan O'Bright, ULSG collections).

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[1] Nelson, Lee H., *History News, volume 24, No. 11*, "Nail Chronology as an aid to dating old buildings", (Nashville, Tennessee: American Association for State and Local History Technical Leaflet 48, November, 1968). In comparing a specimen nail from the Chicken House with Nelson's illustrations, the nail in question appears to be similar to a group Nelson refers to as "modern" machine-cut nails dating from 1830s to present. Nelson noted that "wire nails did not really become the dominant type until the 1890s, and many builders preferred using cut nails well into the twentieth century."

[2] Bill Wenzlick to the author, 12 December, 1992. Wenzlick said that the shed was primarily a chicken house when he was a kid; Jim Davis to the Author, 18 March, 1993. Albert Wenzlick used it as a workshop after it had stood as a storage shed for about 10 years. The building was not used as a chicken house when Jim was around. His father had built a chicken coup about 20 yards north of the building and that was the home for the chickens. Jim remembers that a long shelf ran along the length of the west wall. This was Albert's work bench.

[3] USG, *Papers*, 18: 263. The letter is dated 27 May, 1868.

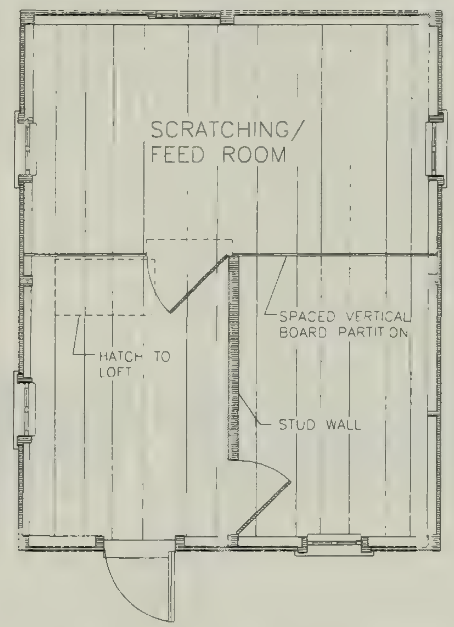

Figure 6.6 - Suggested floor plan of how the Chicken House may have looked prior to interior alterations. Partition locations based upon physical evidence. Door locations are conjectural. (Drawing by the author).

There are indications that room partitions have been removed from the structure. The partitions are believed to have separated the interior space for different functions when the building was initially constructed as a chicken house (Figure 6.6). Because of the size of the north room and the presence of the fowl doors located there, this room probably accommodated roosts and served as a scratching/feed room. The area would have been large enough for many chickens to be fed and sheltered. Hay was most likely stored in the loft area for insulation and dispensed to the lower level through a hay trap whenever fresh hay was needed in the scratching room (Figure 6.7).[4] Of the southern rooms, one may have been a brooding room while the other room was probably a feed storage/egg gathering area.

Siting

Several early twentieth century sources suggest locating a poultry house on a gradual southern slope with "well drained, porous soil" which dries quickly and is purified by rain showers carrying away a part of the impurities.[5] Wet, heavy soil is a good source of plant food and provides a great deal of grass and insects for the fowl to feed on. However, the designers warn against this type of a location because it has the potential to become "muddy and unwholesome" if the fowls are not given a very

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[4] Sherman Dickinson & Harry Lewis, *Poultry Enterprises* (Chicago: J.B. Lippincott Company, 1939), 117 (hereafter cited as Dickinson, *Poultry Enterprises*). "Its [the gable's or even-span roof's] principal advantage is the space in the gable available for feed storage or for straw."

[5] Dickinson, *Poultry Enterprises*, 102-103. George B. Fiske, *Poultry Architecture, A Practical Guide for Construction of Poultry Houses, Coupes, and Yards* (New York: Orange Judd Company, 1910), 1 (hereafter cited as Fiske, *Poultry Architecture*). W.A. Foster and Deane G. Carter, *Farm Buildings* (New York: John Wiley & Sons, Inc., 1928), 122 (hereafter cited as Foster and Carter, *Farm Buildings*, (1928)).

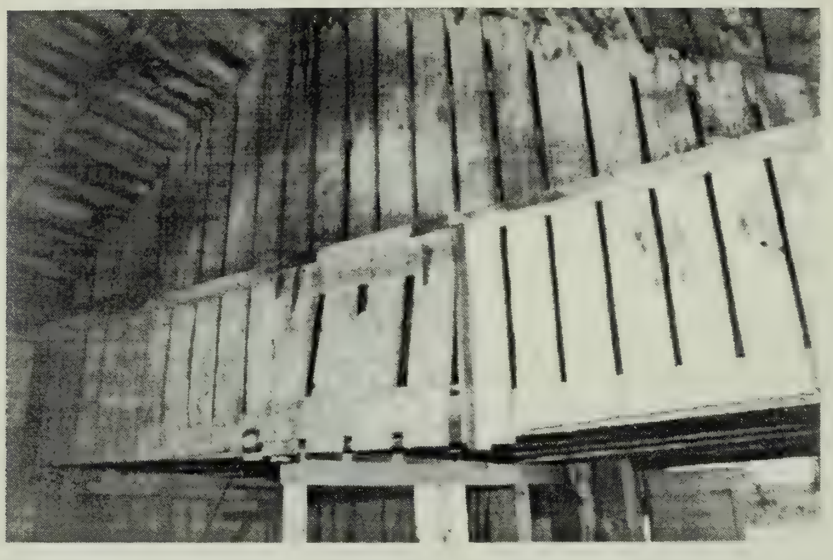

Figure 6.7 - View of the interior partition at loft level, 1994. The ground floor portion of this wall was removed after 1940 to provide greater storage space. Note the hinged hay trap and the spaced vertical boards to promote ventilation. (Photograph by Alan O'Bright, ULSG collections).

wide range of ground.[6] For shelter from the winter winds and storms, it is suggested that wind breaks or forest protection on the north are desirable, but in the summer there should be an optimum of air movement around the poultry house.[7] The building may be situated near the dwelling for easy access, but it should be placed away from highways and well away from feed lots, barns and cribs.[8]

The location of the structure is close to the Main House which made it convenient for residents to care for chickens sheltered there. Although placed on a northwest facing slope as opposed to a southern slope, the earth surrounding the structure is well drained and conducive to the environment needed for successful chicken raising. There is no evidence of a wind break ever being planted to its north side.

Foundation

Typically, poultry houses were recommended to have a stone foundation reaching from one foot above ground down to the frost line or below. This technique would keep a dirt floor "dry and dusty" during the winter while it also prevented rats from entering the structure.[9] When it was not economical to build a foundation wall, small farm buildings were built on posts or piers, leaving a crawlspace between the ground and the floor.[10] If the crawlspace was not encompassed by either

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[6] Fiske, *Poultry Architecture*, 1. Dickinson, *Poultry Enterprises*, 102-103.

[7] Fiske, *Poultry Architecture*, 2. Foster and Carter, *Farm Buildings*, 1928, 122.

[8] Deane G. Carter and W.A. Foster, *Farm Buildings* (New York: John Wiley & Sons, Inc., 1941), 231 (hereafter cited as Carter and Foster, *Farm Buildings*, (1941)). Dickinson, *Poultry Enterprises*, 103. Foster and Carter, *Farm Buildings*, (1928), 122.

[9] Fiske, *Poultry Architecture*, 2.

[10] Fiske, *Poultry Architecture*, 2-3. Jacques, *The House*, 144. "The object of placing this house on piles is to prevent the encroachments of rats, mice, skunks, etc. and is a good method, as rats are very annoying, especially where they have a good harbor under the house, often destroying the eggs and killing the young chickens."

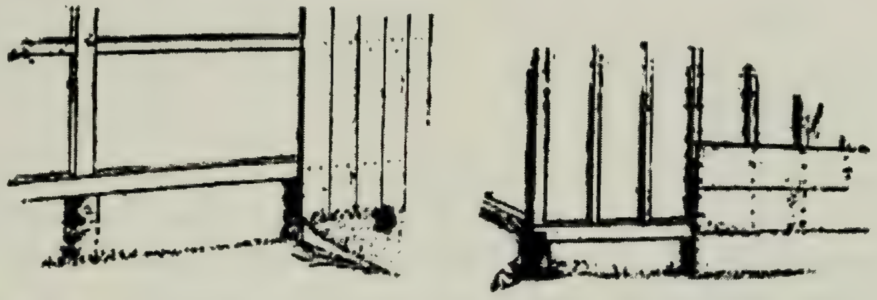

FIG 1: UP AND DOWN AND CROSSWISE BOARDING

Figure 6.8 - "Fig 1: Up and Down And Crosswise Boarding." These examples show two methods used to close the space beneath the poultry house to prevent cold drafts from entering the building through the floor. In both cases, cedar boards extend from sill to ground, and soil is banked against the boards to seal the transition between the two. (Reprinted from George B. Fiske, *Poultry Architecture, A Practical Guide for Construction of Poultry Houses, Coups, and Yards*, (New York: Orange Judd Company, 1910), 3).

vertical or horizontal cedar boards, cold winds would be permitted beneath the building and would reduce the temperature within (Figure 6.8). To make this type of a foundation enclosure tight, it was recommended that "a little soil" be "banked up against the lower end, which is then grassed over quickly."[11]

Piers have supported the Chicken House for as long as the structure has been known to exist in its present location. Photographs from the first half of the twentieth century show horizontal skirt boards enclosing the crawlspace below the floor level of the building (Figures 6.2 through 6.4). Apparently, the builder followed the above prescribed recommendations for enveloping the pier foundation crawlspace of the subject structure.

Size, Shape and Massing

The small individual poultry house design, as opposed to the larger unit house or square house design, is typically 12 feet by 14 feet and accommodates from 35 to 50 adult birds. For small farms, one or two of these small houses may be enough since the floor area needed per bird is between 2 and 4 square feet.[12]

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[11] Fiske, *Poultry Architecture*, 2-3.

[12] John Cochran Wooley, *Farm Buildings* (Columbia, Missouri: The University Co-Operative Store, 1936), 159 (hereafter cited as Wooley, *Farm Buildings)*. Herbert A. Shearer, *Farm Buildings with Plans and Descriptions* (Chicago: Frederick J. Drake & Co., 1917), 126. Carter and Foster, *Farm Buildings*, (1941), 228. Foster and Carter, *Farm Buildings*, (1928), 122, 128.

Poultry house types are often identified by their roof styles. The different styles have been implemented to allow the houses to perform a desired function. The five roof styles which have been common in the past are the shed, gable, half-monitor, gambrel and curved (Figure 6.9).[13]

The subject structure measures 14 feet 2¾ inches by 18 feet 2⅞ inches could qualify it for the category of small individual poultry house design. The actual space available in the north room, or what was probably the scratching room, would have been approximately 108 square feet, allowing for 27 to 54 birds to be kept. It is possible that more birds than this were kept in the building, but would have proven to be extremely crowded.

The building has a gable style roof that allows for a storage or straw loft. Placed just high enough to provide head room, the loft's 1 inch by 6 inch floor joists rest 6 feet 8 inches above the main floor level.[14] At the time that the building was being used to house chickens, the loft may have been filled with straw to absorb dampness, "thus keeping the house drier and preventing the accumulation of frost on the roof in extremely cold weather."[15] The straw also may have served as an insulator which would have kept the house "cooler in the summer and warmer in the winter."[16]

Materials

Design sources suggest that simple, light construction, or wood, is most commonly used in building poultry houses because it is inexpensive and can be altered, moved or changed more easily than

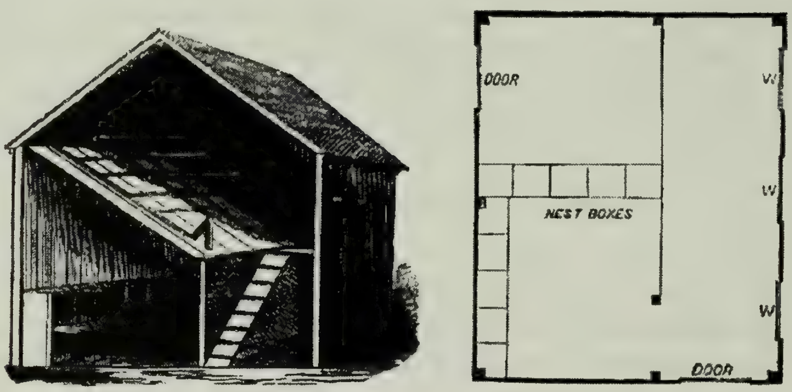

Fig. 84.—SECTION OF HEN HOUSE.

Fig. 85.—PLAN OF HEN HOUSE.

Figure 6.9 - "Fig. 84.—Section of Hen House" and "Fig. 85.—Plan of Hen House." An example of an inexpensive hen house. Interior partitions and functions compare favorably to HS-5 during its use as a chicken house. (Reprinted from *Barn Plans and Out-Buildings*, New York: Orange Judd Company, 1901), 90 and 91).

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[13] Carter and Foster, *Farm Buildings*, (1941), 230-231. Foster and Carter, *Farm Buildings*, (1928), 128.

[14] H.L. Kempster, "The Missouri Poultry House," *University of Missouri Agricultural Extension Service Circular 334*, (Columbia, Missouri: University of Missouri, January, 1936),5 (hereafter cited as Kempster, *Missouri Poultry House*). Kempster mentions that in a loft of a poultry house, "...joists or collar beams are placed just high enough to afford head room"; Carter and Foster, *Farm Buildings*, (1941), 231. "The gable roof house is normally constructed with a ceiling not over 7 feet above the ground floor..."; Wooley, *Farm Buildings*, 158 and 160. "Ceilings in poultry houses are made six and one-half or seven feet high...for the convenience of the attendant."

[15] Kempster, *Missouri Poultry House*, 5. Wooley, *Farm Buildings*, 159.

[16] Foster and Carter, *Farm Buildings*, (1928), 129. Kempster, 5. Wooley, *Farm Buildings*, 159.

Figure 6.10 - "Fig 4: Window for Cold Weather." Type of window used to ventilate a poultry house during cold weather. (Reprinted from George B. Fiske, Poultry Architecture, A Practical Guide for Construction of Poultry Houses, Coups, and Yards, (New York: Orange Judd Company, 1910), 8).

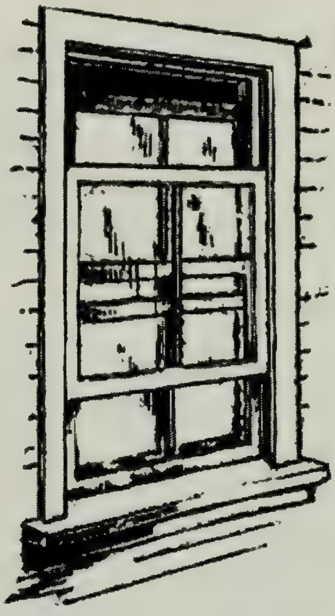

FIG 4: WINDOW FOR COLD WEATHER

concrete or masonry.[17] "Durable lumber" is recommended for the framing and "well-seasoned lumber" for the exterior cladding with "second-hand lumber" being submitted as the best wood to use for cladding because it would not suffer from shrinkage.[18]

The subject structure is a good example of a light, wood frame poultry house with 4 inch square posts and 2 inch by 4 inch top plates supporting 2 inch by 4 inch rafters. The walls consist of vertical boards nailed to the framing. Because there is no evidence that suggests that the vertical siding is "second-hand lumber," it is assumed that the lumber was newly sawn when the building was constructed. The wood plank floor system, which appears to be a replacement floor comprised of "second-hand" planks from the barn, is nailed to 2 inch by 6 inch joists which are in-turn set upon 6 inch square sills.

Ventilation

Air circulation is essential in a poultry house because it helps "remove odors and excess moisture, keeps litter dry, avoids drafts, prevents condensation and supplies...fresh air for the birds."[19] Each house style is vented in a different way. Many shed style houses have supplemental openings between the rafters; other styles have fresh air inlets in the walls and outlet ducts connected to roof ventilators; while gable styles may have roof ventilators or have louvers in each gable end. In the gable or straw-loft house, "warm air, with its supply of moisture, rises into the straw and is carried away in the current of air passing over the straw and through the windows or baffles in the gable ends."[20]

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[17] M.A. Jull & A.R. Lee, *Poultry Houses and Fixtures - Farmer's Bulletin No. 1554* (Washington D.C., U.S. Department of Agriculture, 1934), 20 (hereafter cited as Jull, *Poultry Houses*). Carter and *Foster, Farm Buildings*, (1941), 231. Foster & Carter, *Farm Buildings*, (1928), 123.

[18] Jull, *Poultry Houses*, 20.

[19] Carter & Foster, *Farm Buildings*, (1941), 238.

Windows are also necessary for summer and winter ventilation along with winter warmth. If designed properly, windows should allow light in on cold winter days and should be able to be opened so as not to cause a draft (Figure 6.10).[21] For summer months, the windows need to slide completely open to permit "free circulation of air" throughout the interior space.[22]

The ventilation "system" of the Chicken House is identical to the one described for a gable style poultry house previously mentioned. There is a louvered or baffled opening in each gable end which is centered directly below the ridge of the roof (Figure 6.11). In addition to the gable openings, the lower level has four window sashes which slide upward to allow unobstructed ventilation (Figure 6.12). The louvered openings work in conjunction with the windows to achieve a warm and dry living environment for the flock. From what remains of the Chicken House compared with information obtained from nineteenth century sources, this building is typical of late nineteenth century chicken houses. The structure was probably used as such until the Wenzlick's purchased the property and started using it as a storage shed and workshop.

BUILDING DESCRIPTION

Described as a shed or chicken house, this structure is believed to have been constructed during the late nineteenth century and moved to its present location by 1913. It is located just north of the Main House and east of the Ice House, perched on a hill side overlooking the Prairie Spring at the north property line. The structure is of light wood frame construction supported by an eclectic collection of masonry and log piers. The building measures about 14 feet by 18 feet in plan and features a small loft at the south half of the interior. The entire structure is sheathed in vertical board and batten siding, painted red, and the gable roof is protected with asbestos/cement shingles. The building features a large board and batten door, locations for two small fowl doors, five windows, and two louvered and shuttered gable end openings. Overall the structure is in fair condition.

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[20] Dickinson, *Poultry Enterprises*, 128. Carter and Foster, *Farm Buildings*, (1941), 239.

[21] Fiske, *Poultry Architecture*, 7-8. *Barn Plans and Out-Buildings*, 86. "In winter light and warmth are of the first importance."

[22] *Barn Plans and Out-Buildings*, 86.

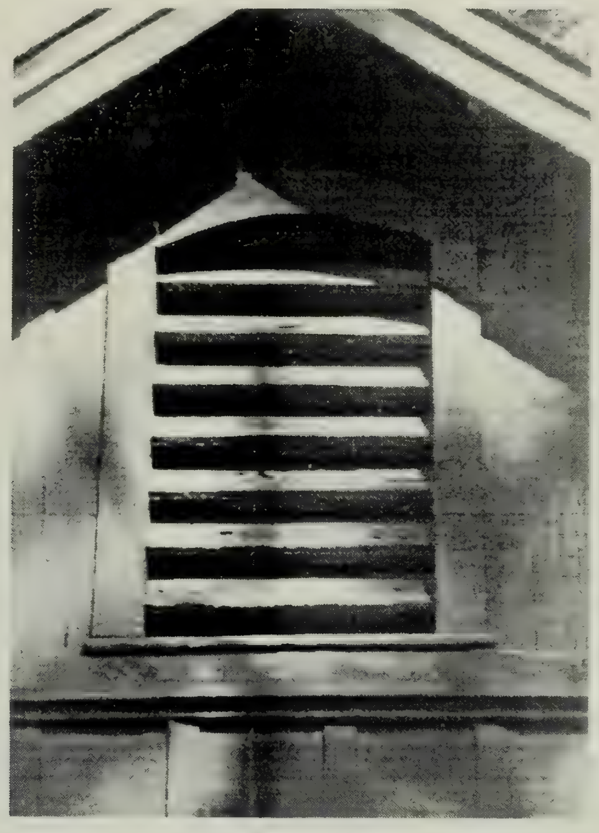

Figure 6.11 - View of south gable end louvered vent, 1994. Note damaged caused by carpenter bees. (Photograph by Al O'Bright, ULSG collections).

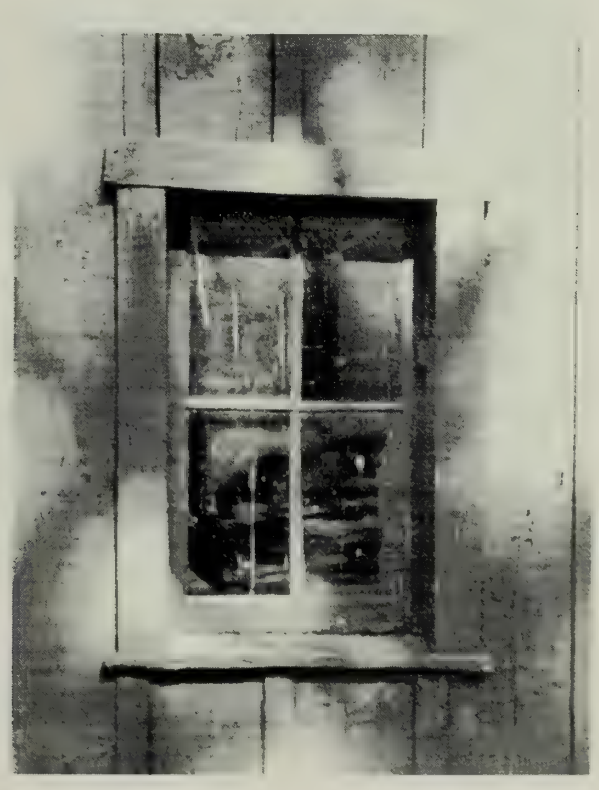

Figure 6.12 - View of window at east elevation, 1994. These types of single sash windows slide up to provide ventilation. (Photograph by Al O'Bright, ULSG collections).

MATERIALS ANALYSIS

Paint

Paint analysis was performed on exterior painted surfaces of the Chicken House in 1992 by Washington University Technical Associates (WUTA). The purpose of the analysis was to determine historic colors applied to the building. The layers tested as follows: White/Red/Brown-Red/Brick-Red.

Wood

In 1992, four wood samples were extracted from structural members and siding in the Chicken House and analyzed by the Forest Products Laboratory, Madison, Wisconsin for the purpose of determining the wood groups used in the building. This information is important for structural loading analysis and for ensuring that compatible wood species are used in the replacement or repair of deteriorated millwork. The siding, joists and loft floor boards were found to be of white pine and the structural framing of red pine.[23]

Asbestos

In 1991, the St. Louis firm, ATC Environmental Inc. was contracted by the National Park Service to survey the extent of asbestos bearing materials at the site. The building possesses asbestos cement shingles which contain 35 percent chrysotile but the firm detected no other asbestos bearing materials.[24]

ARCHEOLOGICAL CONSIDERATIONS

Archeological excavations have not yet been performed beneath or around the Chicken House. When an excavation is conducted, it is likely that poultry related artifacts will be found. It will be important to look for various elements that will give definite indications to the function of the building since its existence at its present location.

SITE CONTEXT

Grade and Drainage

The grade surrounding the structure uniformly slopes down about three feet from the south side to the north side of the structure. The grade at the southeast corner of the building is encroaching upon the structure, covering the sill and the bottom edge of the vertical siding. Wooden cribbing has been constructed on the east side of the building to retain the soil. Surface drainage runs directly to a small creek at the base of the hill.

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[23] Alden, samples W-0BBE-51, W-OBBF-52, W-OBB-53 and W-0BB-50.

[24] ATC, 4.

Vegetation

A few small trees and bushes, along with two walnut trees are currently growing in close proximity of the Chicken House, although they pose no threat to the structural integrity of the building (Figure 6.5).

FABRIC SURVEY

Foundation System

The pier system that supports the Chicken House is not original to the structure. The building has had two or three episodes of piers during the past 60 to 70 years, with the last set being placed in the early 1960s.[25] The present foundation system includes various types of piers consisting of concrete blocks, 4 inch bricks, and unbarked logs which appear to have been wedged between the ground and the floor joists along with a composite "grade beam" of wood and concrete. The brick piers are in poor condition; the east-center pier is so out-of-plumb it no longer gives support to the building. The concrete block piers are in good condition but the unbarked logs are in very poor condition having rotted at ground level. One pier on the west perimeter consists of both concrete blocks and a top row of 4 inch bricks. The north-central perimeter pier is made up of concrete blocks, but the other piers that are in line with the center of the structure are rotted, unbarked logs. The condition of the existing foundation is so precarious the Chicken House would be severely damaged in the event of a moderate earthquake or very high wind.[26]

Wood plank cribbing, placed along the east side of the structure, appears to have been constructed in an attempt to prevent the grade from overtaking the piers along that edge. The cribbing also may have been installed to enclose the underside and insulate the chicken house (see 1992 HABS drawing, East Elevation).[27] At the southeast corner, the cribbing and the bottom portion of the vertical siding have been overtaken by soil. The sill at that corner has rotted from contact with the ground causing that corner to settle unevenly which in-turn has resulted in a 4 inch deformation in the floor level.

Structural Framing System

The light wood frame's 6 inch square foundation sills are lapped at the corners and rest upon the piers and grade supports. The structure is not tied to the pier foundation. The north sill measures 13 feet 11½ inches long and is in good condition. The south sill is not easily accessed for inspection but appears to be discontinuous below the threshold of the door. The west sill is a continuous 17 foot 6¾ inch member which is in good condition. The east sill appears to have been cut at center,

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[25] Bill Wenzlick to the author, 22 December, 1992.

[26] HA, *Structural*, 37.

[27] Fiske, *Poultry Architecture*, 2. When farm buildings were built on posts to avoid the cost of a full stone foundation, it was recommended that boards be extended to the ground so the building was not open beneath, permitting cold winds to reduce the temperature of the building.

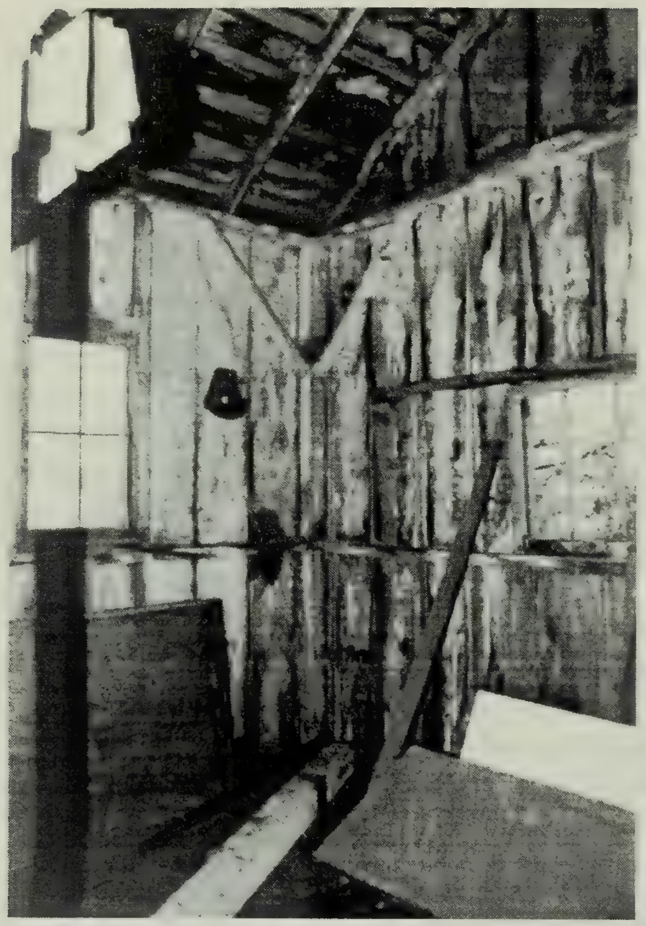

Figure 6.13 - Northwest interior corner, 1994. Note the light wood frame construction and whitewash finish. The window at right may have been salvaged from the Barn (HS-3). (Photograph by Alan O'Bright, ULSG collections).

its southern portion has been replaced by a new timber which is very deteriorated. The probable cause for this replacement and continuing deterioration is encroachment of the surrounding grade at the southeast corner of the structure, causing the sill to rot rapidly.

The 2 inch by 6 inch vertical sawn joists are spaced at 24 inches on center. Each of the joists are notched ½ inch on each end where they rest on top of the west and east sills. The existing floor has been calculated to support a 36 pounds per square foot live load.[28] The joists support a floor comprised of 1 inch thick, random sized boards.

The loft floor is supported by 1 inch by 6 inch joists resting on ledgers fastened to the east and west walls. The floor has little calculated live load capacity although large quantities of scrap lumber and sheet metal have been stored there for decades.[29]

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[28] HA, *Structural*, 36.

[29] HA, *Structural*, 36.

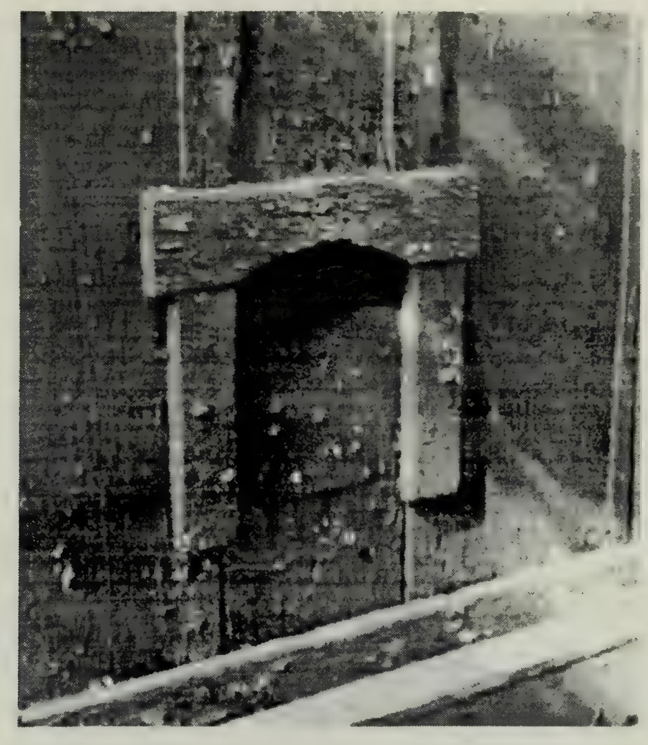

Figure 6.14 - View of chicken door at east exterior elevation, 1994. (Photograph by Alan O'Bright, ULSG collections).

Four inch by four inch red pine vertical posts are fastened to the sills with cut nails at each corner and at the center of the west, east and north walls.[30] Two inch by 4 inch boards placed horizontally between the vertical posts at 3 feet 7 inches from floor level act as nailers for the vertical board siding and also double as a sub-sill for the windows. The 2 inch by 4 inch top plate, which ties the posts together and supports the 2 inch by 4 inch rafters, is lap joined at each corner and is diagonally braced to the corner posts with 1 inch by 4 inch boards.

The rafters are spaced at 24 inches on center and meet at a 1 inch by 6 inch ridge board. Although some of the rafters are separating from the ridge board, the system appears serviceable. The rafters appear to be in good condition but the ridge board is deteriorated and in poor to fair condition. The existing roof system will support a ground snow load of 20 pounds per square foot.[31]

Exterior Cladding Systems

The frame of the Chicken House is sheathed with vertical sawn 1 inch by 12 inch white pine vertical board siding which is fastened with cut-nails on all sides and at the gable ends.[32] The gaps between the vertical boards are covered with 2½ inch battens which are nailed-up with wire nails. A horizontal 5½ inch composite band board is located at the juncture of the soffit and exterior wall on the gable ends. The interior surface of the boards still display a white-washed finish while several colors of paint have been applied to the exterior (Figure 6.13). On the east wall, a very small opening is located at floor level and directly opposite of the opening, on the west wall, an identical opening was once in place but is now in-filled by a replacement board (Figure 6.14). A spring closing "doggie" door was cut in the west wall by Bill Wenzlick sometime in the early 1960s. Most of the boards are in fair to good condition with the exception of some that have rotted ends. The exterior was last painted during the late 1980s.[33]

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[30] Alden, sample W-OBB-50.

[31] HA, *Structural*, 36.

[32] Alden, sample W-OBBE-51.

Roof Systems

Nailed to the rafters are 1 inch by 6 inch spaced sheathing boards covered with a layer of what appears to be the original wood shingles which are in-turn covered by a layer of roll roofing and asbestos cement shingles. The gabled roof's south ridge measures at 14 feet 3⅛ inches above grade while the north end measures at 17 feet 6½ inches because of the slope in grade. The sheathing is deteriorated; the layers of roofing are in poor condition. Upon inspection of historic photographs, it appears that the wood shingled roof was in a state of disrepair in 1913. A portion of the west leaf had been patched with roll roofing lain vertically from the eave to the ridge cap. Sometime between 1913 and 1940, the roll roofing was removed and the roof was repaired with new wood shingles. By 1940, most of the shingle ridge cap was removed, but a segment of it seen in Figure 6.3 remained at the center of the roof. Sometime around 1940 the wood shingles were covered by roll roofing and asbestos cement shingles which are in place today.

The eave and rake fasciae are 1 inch by 7 inch boards. The rake fasciae presently have an added 2 inch board along the top edged to which the roll roofing is nailed. An added 2½ inch trim board is nailed to the face of the eave fascias for an unknown reason. These small boards do not appear in the photos from 1940 or 1913 and therefore are assumed to be additions to the fascias. The trim boards are generally in poor to fair condition due to insect damage.

Doors

The only door in the structure is located on the south elevation (Figure 6.15). At one time, the door measured 29½ inches wide, and, according to photographic records, the door had not yet been widened to its present measurement of 47¾ inches until sometime after 1940 (Figure 6.3). The existing door, which is in good condition, contains the original batten door extended by three longer battens placed above the original battens allowing for more boards to be added. Like the vertical siding, the vertical boards that make up the door are 1 inch by 12 inch boards with 2½ inch wide vertical battens nailed over the gaps. The door may have been widened after the changes to the main house were finished and attention was drawn to the other buildings on site. It may be that the floor boards of the outbuilding were also changed out and the partitions removed at that time.[34]

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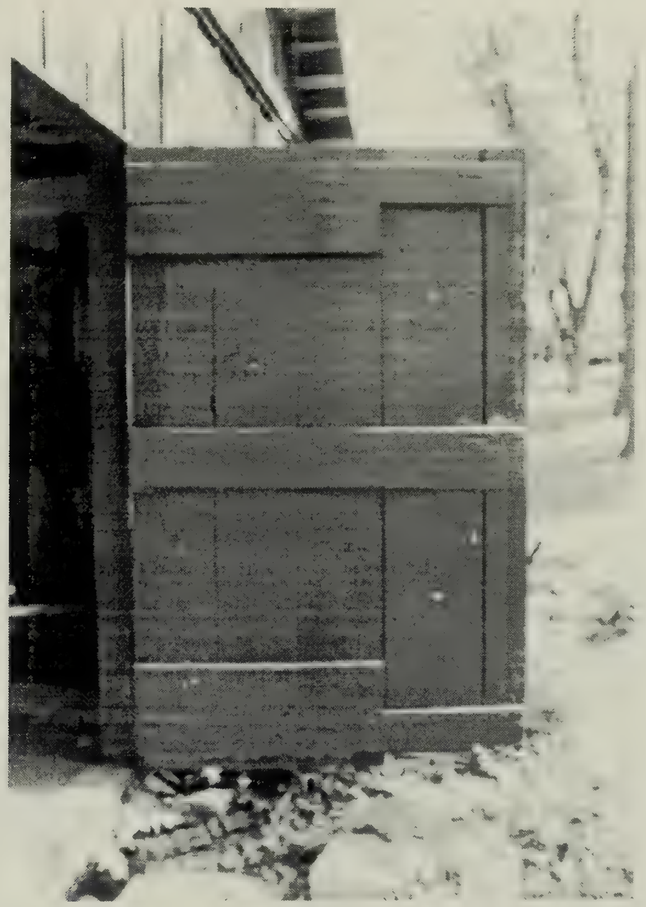
[33] 33. Grant L. Mugge to Alan O'Bright, 10 January, 1995. The building was spray painted.

[34] 34. James Davis to the author, 18 March, 1993. Davis said that he remembers a partition that went down the center of the building, possibly from the south wall all the way to the north wall. To his recollection, there was no partition at the edge of the hay loft

Figure 6.15 - Interior surface of door, 1994. Note shorter, original battens. (Photograph by Alan O'Bright, ULSG collections).



Two small chicken doors were placed at the east and west elevations, although neither function at present.

Windows

The rhythm of the board and batten siding is punctuated by six original framed window openings, measuring approximately 2 feet by 3 feet, and one recently added 2 feet by 2 feet 2½ inches unframed opening. Four of the original window openings are located in the main level of the south, west, and east walls and are single sash windows which slide open vertically. Originally, the windows had four panes; three windows retain this configuration and are in fair to good condition. The panes and exterior side muntins of one west elevation window sash has been eliminated, and a single sheet of glass is currently set in the sash. The shutters located on the upper openings appear to be in good condition, but the louvers have been tattooed by carpenter bees. The added window opening and three pane sash may have been salvaged from the west elevation of the barn (see 1991 HABS drawing, North Elevation). The window is in fair to good condition.

DOCUMENTATION DRAWINGS

No drawings are known to exist for the Chicken House previous to 1991. In that year a single sheet of drawings was prepared by HABS. Preliminary drawings were also prepared in 1994 for structural treatment of the building (NPS 357/80012).

PART 2: TREATMENT AND USE

TREATMENT RECOMMENDATIONS

The original construction site and period of construction for the Chicken House is unknown. The only information known concerning the placement of the structure at its current location is found in comparing a 1913 photograph of the site with an 1875 lithograph from Frank Leslie's Illustrated Newspaper. It is noted that the structure is not depicted by the artist in the lithograph but that it is present in the 1913 photograph. After careful inspection of the structure, it was determined that the building originally served as a chicken house. Later, the building became a storage shed following the removal of its partitions and replacement of its floor.

The presence of the Chicken House poses a minor anachronism in the development of the historic area surrounding the Main House to an 1875 appearance; the building apparently did not exist in 1875, or at least not at its current location. In a purist sense, the only true reason to save the Chicken House would be if the historic core of the site were strictly preserved. However, there remains a nagging gap in the knowledge of structures ancillary to the Main House between 1875 and 1913. It would be irresponsible to demolish the structure or move it to an innocuous on site location because of a knowledge deficiency. There is a strong possibility that additional late nineteenth century graphic information on the Chicken House will be discovered within the coming years. Until such time it is recommended that the Chicken House remain in its existing location and steps be taken to preserve the structure.

The recommend treatment of the Chicken House will include a combination of preservation, restoration and repair techniques. The exterior appearance has changed only slightly since the 1913. It is recommended that the exterior of the building be returned to its appearance prior to the changes that took place after 1940. Although the interior appearance was modified by removal of partitions, the interior should remain as it is since the positions of interior doorways are unknown. It is recommended that the interior be used for park storage and not be accessible to the general public.

To ensure prolonged preservation of historic fabric, the ensuing comments will address treatment and removal recommendations specific to existing building systems and elements.

Site

Remove vegetation and trees that may hinder the rehabilitation of the chicken house and its pier foundation. Back-fill and regrade the soil surrounding the structure, ensuring that the grade does not encroach upon the sills.

Foundation

The foundation piers are not structurally sound and are in the process of failing. The existing pier foundation system should be completely removed after the frame structure has been lifted and temporarily supported. After the existing piers are removed, concrete footings and piers should be placed at the north, west, and east perimeters. The grade at the southeast corner should be lowered to prevent soil contact with structural members.

Structural Framing Systems

The east and south sills in the Chicken House are suffering from deterioration and should either be repaired or replaced. As a result of the unchecked deterioration of the sills, there is a noticeable deformation in the floor level at the southeast corner of the building possibly indicating that the joists at this point are also victims of decay and may be in need of repair or replacement. The floor boards do not appear to be in need of repair but it is recommended that an intermediate beam be placed beneath the midpoint of the existing joists to provide additional support.[35]

Although the loft framing is in good condition and need not be repaired, it is recommended that scrap lumber and other debris be removed from the loft and the area be closed to storage.

Roof rafters should be inspected at the time roofing repairs are initiated. Any deteriorated rafters or the ridge board should be repaired or replaced as necessary to preserve the integrity of the roof.

Roof System

The existing asphalt strip shingles and plywood sheathing should be removed and the 1 inch thick, random sized sheathing boards replaced in kind where deteriorated. New sawn wood shingles, pressure treated with at least a Class C fire retardant, should be installed directly over the new board sheathing.

Exterior Cladding, Trim, and Finishes

Replacement or in-fill cladding shall match adjacent cladding as close as possible. Some of the end boards and fascia boards that have fallen victim to carpenter bees and squirrels should be repaired or replaced depending on the severity of the damage. Most of the trim around the window openings and at the gable ends appears serviceable but may need some repair. A few of the battens should be repaired or replaced.

It is recommended that all existing painted exterior surfaces which are to remain in place, be stripped of lead bearing paint. Removing all lead-bearing paint will preclude the necessity of enclosing the structure to prevent the escape of lead particles into the air or ground during future paint preparation or repair work.

It is recommended that the red color found in Layer 2 of the paint analysis be used to paint the exterior of the chicken house. The Layer 1 white layer may have been a primer coat (see Appendix D - Paint Analysis).

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[35] HA, *Structural*, 37.

Seismic Reinforcement

Since the chicken house is a light-weight structure, no extraordinary measures need to be taken to laterally brace the building. However, it is recommended that the building be strongly secured to the concrete piers to prevent the structure from overturning from wind and seismic loads.

Doors

The existing door should be narrowed to its original width prior to the circa 1960 alteration. The members of this batten door are in good condition and should only need to be scraped and repainted.

Windows

The north elevation window is not original to the structure and should be removed. The original windows (102, 103, 104 and 105) are still intact but should be scraped and repaired. (Window 104 has been altered from its original configuration and will require more attention to be restored).

Accessibility

Any trail that encompasses the structure should be in compliance with the Uniform Federal Accessibility Standard. A grade ramp could be constructed at the door to allow unobstructed access to the interior of the building.

Cost Estimate

Chicken House (HS-5)
Final Treatment Recommendation
Ulysses S. Grant NHS

The following table summarizes Class C cost estimates associated with the preservation of the Chicken House. All work is assumed to be accomplished by contract labor. These estimates reflect 1995 costs for completion of the proposed alternative. If implementation of a proposed treatment is delayed, it is recommended that the following figures be reviewed and revised to include adjustments for inflation of materials and services.

Category	**Description**	**Cost**
Site	Lift frame structure, remove existing piers, pier and retaining wall excavation, grading, walk	$5,100.00
Structure	Construct brick piers and foundation, back fill	$5,500.00
Exterior	Surface preparation and painting, repair/replace siding, roof and endwall repair	$13,200.00
Doors & Windows	Return door to original width and repair, replace threshold, repair and paint windows	$4,500.00
	Subtotal	$28,300.00
General Conditions	Insurance, temporary utilities, mobilization, equipment (10%)	$2,830.00
	Subtotal	$31,130.00
	Profit and Overhead (15%)	$4,669.50
	Subtotal	$35,799.50
	Contingency (10%)	$3,579.95
	Total (Construction)	$39,379.45
A/E Title II	Structural, mechanical, and electrical construction documents	$1,698.00
WASO Contingency	(31%)	$12,207.63
Archeology	Archeological mitigation	$15,000.00
	Total (Construction, Design, Inspection, Archeology)	$68,285.08

DIVISION VII - OTHER STRUCTURES

Many other structures and manmade features were constructed on the site to serve the functional, aesthetic, and entertainment needs of the former owners. While some of these structures are not considered to be significant in terms of their association with Ulysses S. Grant, nor even their relationship to the nineteenth century, it is thought that they should be mentioned and described to acknowledge their existence or former existence for the benefit of future archeological excavations and cultural landscape studies.[1] Also, it is thought to be important that any information on the structures uncovered during personal interviews and documentation research should be expressed in this document rather than allowing the notes to remain buried within office file folders.

Flagstone Walkway (HS-06)

It is believed that a walkway has existed at the front of the house at least since around 1840 when one door replaced the double entries at the ground floor of the house (See Division 2, Historic Building Chronology, Phase III). It is unknown at this time if a walkway or walkways existed leading to a fence gate at the drive. The figures are vague as to whether the walk was paved or dirt.

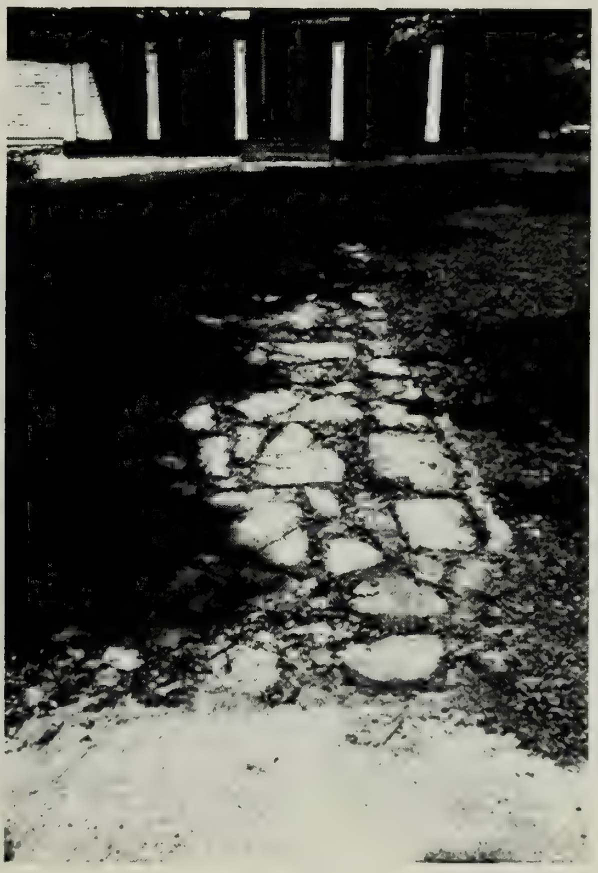

Figure 7.1 - Existing flagstone walkway, May 1994. The walk was relaid around 1916. The stones are in very poor condition. (Photo by the author, ULSG collections).

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[1] See Mark Weekly, "Cultural Landscape Assessment, Ulysses S. Grant National Historic Site, St. Louis, Missouri" (Omaha, Nebraska: National Park Service, U.S. Department of the Interior, 1993, draft copy), (hereafter cited as Weekly, *Cultural Landscape Assessment*, 1993). The purpose of Division VII is to provide future researchers with background information on specific site objects and features. There is no attempt in Division VII to develop a contexural nor cultural landscape study. Note that Weekly's draft study is not current with information discovered since 1993, particularly with regard to nineteenth century images.

By at least 1890 the walk was paved with large flagstones. In Figure 2.10 the walk appears to be about 4 feet to 5 feet wide as it approaches the porch, then arcs to about 8 feet wide approximately 15 feet from the stone steps. The walk is seen to be edged in stone set upright.

In one 1916 account, Mrs. John C. Dent was recorded to have confirmed the nineteenth century existence of a stone walk but the time she was last at the site is unknown.

> "O, I am so glad," she said, "that you have kept the old flagstone walk to the front gate."[2]

It is believed that the bulk of the existing flagstone walk was installed during Albert Wenzlick's ownership although some of the original stone may still be in place or used in the reconstruction work. Site caretaker Charles B. Davis is believed to have installed the walk that remains today.[3] The stones came from a rock outcropping located just north of the Ice House adjacent to the stream.[4] The arcs seen in Figure 2.10 were removed and straightened and many of the stones are broken and heaved.

It is recommended that the existing walk be removed and relaid to conform to current accessibility standards (See Division II, Accessibility Evaluation). The arcs and edge stones should be replicated as close as possible to that seen in Figure 2.10. Archeological excavations should be performed prior to any stone removal or regrading.

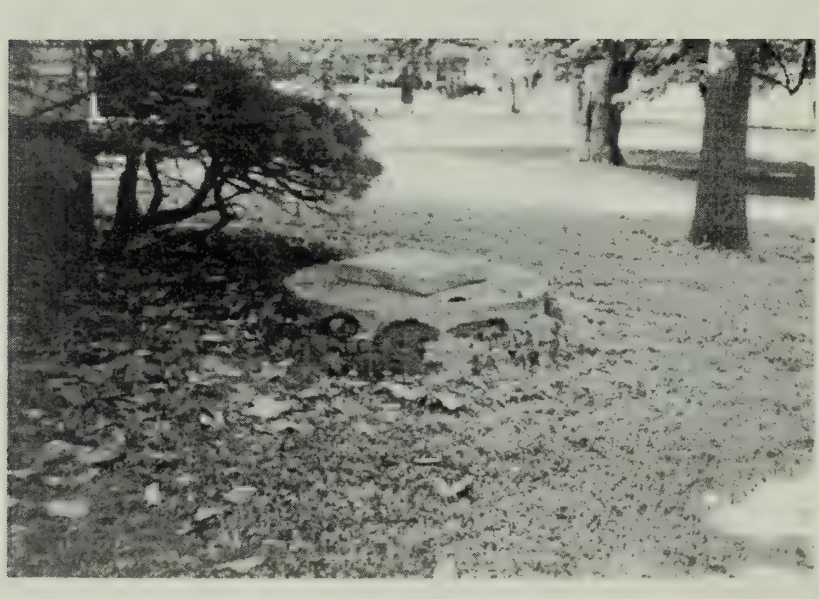

Figure 7.2 - The Main House cistern, May 1994. The top of the brick cistern is covered with cast concrete. The depth of the cistern is unknown as it is filled with twentieth century debris. (Photo by the author, ULSG collections).

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[2] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 34.

[3] James and Charles B. Davis to the author, 18 March, 1993. According to the Davis's the walk was replaced by their father to "spruce up the place" in preparation for a visit from Grant's niece.

[4] Bill Wenzlick to the author, 30 November, 1992. The flagstone was a continual maintenance problem as the stones heaved and separated on a cyclical basis.

Main House Cistern (HS-7)

A brick cistern exists at the northwest corner of the house. This cistern (HS-7) was first documented in photographs taken in 1913 when the property was purchased by Albert Wenzlick (Figure 2.10). At that time at least the western portion of house roof gutters were routed to the cistern, and it was capped by a wooden platform. The cistern continued to furnish water for washing until the site was furnished with public utility water. Water was drawn with a chain pump.[5]

The cistern has a maximum interior diameter of about 8 feet but corbels to a 4 foot diameter brick opening at the top. Its depth is unknown. At present the cistern is capped by a poured concrete slab and its access hole sealed by loose concrete blocks. The top foot of the brick lining is exposed above grade. The brick is parge coated with portland cement based mortar inside and out. The mortar coating is severely cracked and some of the brick spalled at the exterior but the interior coat is intact. The interior is partially filled with contemporary bottles, cans, and trash but at least one inlet can be seen at the interior southwest. There is no indication that water is directed into the cistern from existing downspouts.

The cistern is in no immediate danger of deterioration but the area around the cistern should be protected from heavy machinery during construction restoration work on the house. It is recommended that the hard mortar coat at the exterior be carefully removed and replaced with a more appropriate mix. A mortar analysis should be performed to determine mortar mix characteristics.

As for long-term treatment it is recommended that the Main House cistern remain in its current state until such time that archeological mitigation work is required for any substantial preservation or maintenance work. Accurate documentation drawings should be made prior to any work. Trash should be removed from the cistern and an inspection made of the bottom grade. An inspection should also be made of the interior construction and condition but the concrete cap will have to be removed to afford internal access.

Driveway (HS-8)

It is believed that the original drive route is underlain by a portion of the present driveway system. The earliest photographic documentation shows a portion of the rutted and eroded dirt drive southwest and south of the house (Figure 2.3). While early engravings of the site intimate the presence of a drive south of the house (Figures 2.3 and 2.3), the bulk of a drive route is not shown until the publishing of an 1875 engraving.[6] In Figure 2.5 the drive begins at the railroad line, passes through a fence opening, over a small wooden bridge, and then through another fence opening. The depicted route is consistent with the first 300 feet of the existing driveway, and the route seen in Figure 2.3. It is assumed that the old dirt drive angled 100 feet south before curving east to the front of the house much as it does now. Figure 2.5 also indicates a secondary drive to the cow barn that was located about where the park office now sits. It is believed that a secondary drive also extended to the east elevation of the horse barn along the same paved route that exists just southeast of the park office building, and can be seen in an early Wenzlick photograph (Figure 4.2).

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[5] Bill Wenzlick to the author 2 November, 1992. Wenzlick does not recall what happened to the house nor cottage chain pumps except that his father may have given them away.

[6] Weekly, *Cultural Landscape Assessment*, 1993, 13-15. Weekly contends that the lane was a straight shot from the path that parallelled Gravois Creek to the front of the Main House based upon a Dent-era 1848 plat map of the site (page 14). Weekly offers that the plat map may have been in error, but cannot account for the present double bend in the lane. This author believes that the bend was created as a result of the first barn placed on the site in the area now occupied by the Cottage (see Cow Barn). The placement of William Lindsey Long's cabin prior to construction of the Main House (see Division II, Historical Background and Context), and the former course of the Prairie Creek may also have had an influence on the lane route early in the nineteenth century.

The drive remained dirt when the property was acquired by Albert Wenzlick in 1913. Albert had the drive paved in concrete in the late teens or early 1920s probably to provide a more stable and level surface for automobile travel.[7] Even the drive to the east side of the barn was paved (Figure 4.4). The small wooden bridge spanning a small spring or ditch was probably removed and the depression backfilled at that time (See Drain Pipe).

A temporary drive was installed in the late 1910s or early 1920s, extending the main drive east past the house to Rock Hill Road. Apparently Albert was persuaded to allow neighbor and beer baron August A. Busch, Sr., to construct the drive so that August had a means to access his property when Gravois Road was closed for paving work.[8] The drive served Busch for about one year, and served as an alternate route for the Wenzlick family until around 1929 when property on which it was located was sold. The temporary drive was constructed of coal clinker gravel, some of which was found during 1992 excavation work to install an underground electrical service line. Clinker laden fill found beneath fireplace hearth bricks in the house during physical investigations may have also come from that portion of the drive.

There is no documentary evidence that a permanent driveway ever existed at the back of the Main House, although horse and vehicle access may have been limited to occasional private use. Delbert Wenzlick extended the drive north of the house to Whitehaven Drive about the time that the Stone Building was converted into a garage around 1950. By that time the surface of the concrete drive had spalled and become rough and uneven. He paved the old concrete road bed and the new driveway with asphalt which remains intact today.[9] The drive was extended east in front and in back of the house to the existing gate at the northeast corner of the property during the late 1950s or early 1960s when the adjacent subdivision was developed.

It is recommended that the existing driveway remain intact until such time that recommendations are carried out though an approved cultural landscape plan. It is recommended that archeological excavations be made to confirm the existence of the historic drive surface beneath the existing concrete and asphalt drive prior to any excavation or removal work.

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[7] Bill Wenzlick to the author, 2 November, 1992, and James Davis to the author, 18 March, 1993. Charles B. Davis mixed and placed the concrete using mixing machines he borrowed or rented from workers paving Gravois Road.

[8] Bill Wenzlick to the author, 30 November, 1992. Wenzlick recalled that his grandmother Emma, a fanatic prohibitionist, would always remove herself to the house interior from the front porch when Busch was seen to approach the house on the driveway.

[9] Bill Wenzlick to the author, 30 November, 1992. Albert Wenzlick had oil and pea gravel applied on the concrete drive when it began to deteriorate.

Barn Well (HS-9)

An open brick lined well exists just south of the cottage. It is believed that the well initially furnished the barn with water during the nineteenth century and therefore may have been in existence since construction of the barn around 1870. During Albert Wenzlick's ownership an electric pump was installed to deliver drinking water to the Main House via a storage tank which was located east of the house.[10]

When the property was acquired by the NPS in 1990 the well was covered with corroded expanded metal screen. It has since been concealed for safety considerations with a stout wooden platform constructed by the NPS. The well has an opening diameter of 4 foot, and a depth measuring about 14 feet. No free standing water was seen at the bottom during Summer 1992. The well has remnants of a piping system probably installed by the Wenzlicks which is still fastened to the wall. There are boards, bags, and trash in the bottom.

To prevent accidental entry of persons or materials which may contaminate ground water it is recommended that the well be completely backfilled in accordance with any Missouri regulations regarding open wells. A determination should be made if archeological mitigation should proceed prior to trash being removed from the well in preparation for backfilling. Brick and mortar samples should be taken before the well is completely sealed.

Arbors (Demolished)

A wooden arbor featuring benches at each side once spanned the flagstone walk at the front of the house near its intersection with the drive.[11] It is believed that the arbor was constructed during Albert Wenzlick's ownership during the teens or 1920s and removed by 1940.[12]

Another arbor can be seen just east of the house in a 1928 photograph (Figure 2.20). It is unknown if this arbor is the previously mentioned arbor in a new location, or a totally different one. In any case it no longer exists.

Bill Wenzlick recalled that there were grape arbors near the southwest corner of the existing property.[13] The arbors were probably removed prior to World War II.

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[10] Bill Wenzlick informally to the author. James Davis recalled during a 18 March, 1993 interview with the author that the well furnished water to the caretaker's house when the cistern water tuned bad. Wenzlick movies taken during the late 1920s show children playing at the tank remains.

[11] The arbor was visible in movies in the possession of Bill Wenzlick taken during the 1920s.

[12] Bill Wenzlick to the author, 30 November, 1992. Wenzlick's grandmother, Emma Schall, may have constructed the arbor.

[13] Bill Wenzlick to the author, 17 June, 1993. There was also a strawberry field between the cottage and the railroad tracks. The rows ran perpendicular to the tracks.

Barbecue Pit (Demolished)

A stone cookout pit was constructed about 30 feet west of the Icehouse along the existing location of the driveway by Charles B. Davis for Albert Wenzlick around 1930.[14] The pit was removed by around the 1940s.

Chicken Coop and Houses (Demolished)

Other than the extant Chicken House, there were two other documented chicken houses and one coop on the site. The coop was attached to the northeast corner of the Barn and was in active use during the 1930s (Figure 4.5).[15] The coop was simply constructed of posts set into the ground and a light wooden framework supporting a chicken wire cage. It is unknown if the coop was constructed by Albert Wenzlick or a nineteenth century owner. The coop was probably demolished when the Barn wings were removed in the 1940s or 1950s.

James Davis recalled the existence of a substantially sized chicken house located about 40 yards east of the existing Chicken House. This chicken house accommodated between 200 and 300 chickens.[16] A 1940 HABS photograph of the two extant outbuildings has a partial image of what is believed to be this chicken house (Figure 6.3). It is unknown when the structure was constructed or demolished.

A small chicken house appears in a newspaper article photograph taken in 1928.[17] This structure had a shed roof with a slatted door and was referred to as the "Davis' chicken house."[18] It is unknown when the structure was constructed or demolished.

Corn Crib (Demolished)

A corn crib appears at the southeast corner of the former location of the Grant barn in early Wenzlick and 1940 HABS photographs (Figures 4.4 and 4.6). Its date of construction is unknown, but based upon the construction style the corn crib could have been as early as the 1860s in association with Grant or Conn ownership.[19] However, Bill Wenzlick recalled that the crib lumber was relatively new when he played in the structure during the late 1920s. He also recalled that the crib was used for corn storage during the period that his grandfather, Albert, owned White Haven. The crib may have been constructed by site caretaker Charles B. Davis.[20] The crib was demolished sometime after 1940 during Delbert Wenzlick's ownership.

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[14] Bill Wenzlick to the author, 17 September, 1992. The pit was seen in movies taken during the late 1920s.

[15] Movies taken during the late 1920s by Albert Wenzlick also clearly the coop in operation.

[16] James Davis to the author, 18 March, 1993. The chickens were hatched in the caretaker cottage basement.

[17] "The Home in which Gen. Grant Courted and Lived is Still a Staunch Structure," *St. Louis Globe-Democrat Magazine*, 4 November, 1928, 4. The image appears at the left edge and beneath the large tree.

[18] Bill Wenzlick informally to ULSG staff.

[19] Keith E. Roe, *Corncribs in History, Folklife, & Architecture* (Ames, Iowa: Iowa State University Press, 1988), 27, and *Barn Plans and Outbuildings*, 128-129. The 1864 example offered by Roe is nearly identical to the image in the Figures, but the style could have been constructed into the early twentieth century.

Cottage

The structure known as the Cottage, caretaker's quarters, tenant house, or "little house," currently serves as the park administrative office.[21] A one-and-one-half story bungalow with a north facing porch was constructed around 1914 for Albert Wenzlick to serve as quarters for the family of site caretaker Charles Burton Davis (Figure 7.3).[22] The top floor was destroyed by fire during World War II.[23] Delbert Wenzlick rehabilitated the building for use as rental property sans second floor sometime during the 1940s. The existing attached breezeway and garage, and the fireplace are believed to have been constructed at that time. A bedroom wing addition was added in the 1970s (Figure 7.4).

Nine Davis family children and their parents occupied the house full time from its construction until just after Albert's death in 1937.[24] The house is believed to have been unoccupied for a couple years until the fire. After the damage was repaired a man named Rockhouse lived there briefly until he fell into disagreement with Delbert. Delmar H. Bone rented the house from 1945 through 1948, which Bill Wenzlick moved in and leased the house until 1951. New car salesman Sherod (Sam) D. Banks followed Bill Wenzlick's tenancy until 1954. Site caretaker Edward Eibert occupied the house from 1970 until about 1977. A woman who made ceramics and stored hundreds of moulds in the basement occupied the house for an unknown period of time. Upon her death Grantwood Village policeman Jack Inglesby rented the house from 1980 until 1985.[25] The house remained vacant until 1991. During that time little or no maintenance was performed which led to severe deterioration of the structure.

When the property was acquired by the NPS in 1990 the building was in a state of extreme deterioration, but a decision was adopted to use the existing space for administrative offices rather than construct a completely new facility or bring in a trailer. During Summer 1991 renovation work

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[20] Bill Wenzlick to the author, 8 December. 1994.

[21] A circa 1950s stereo slide from Bill Wenzlick's collection labeled "tenant house." Wenzlick has referred to the building as the "little house" many times during informal conversations.

[22] Charles R. Davis to the author, 18 March, 1993. The Davis family lived in the Main House for about one year until completion of the caretaker's house. There were four bedrooms and a bathroom in the southwest corner on the second floor, and two bedrooms, kitchen, dining room, and living room on the first floor. The stair was open on one side. Charles Davis believes that the house may have been a mail order house but his contention has yet to be confirmed by physical evidence.

[23] One charred rafter was found in the Barn loft in 1994, and one charred joist or rafter was found in the Main House during 1995 removal work. It is believed that these members were salvaged from the Cottage after it burned.

[24] Charles B. Davis to the author, 18 March, 1993. The Davis family moved from Ste. Genevieve to White Haven specifically to work for Albert Wenzlick.

[25] Bill Wenzlick to the author, 2 November, 1992, and Bill Wenzlick, undated notes taken during interview with Kimberly S. Little, ULSG files. Spelling of some of the occupant's names and periods of occupation may be inaccurate.

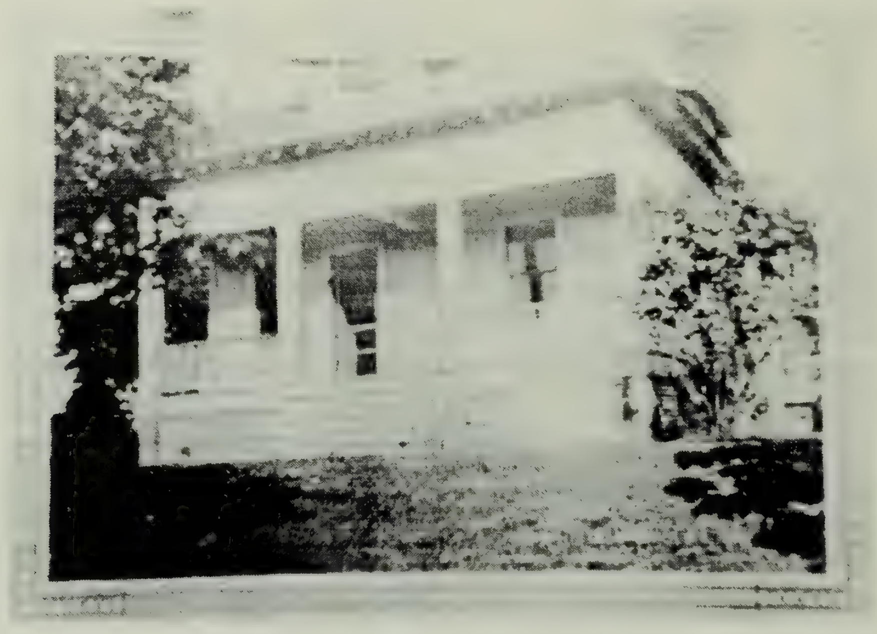

Figure 7.3 - The north elevation of the Cottage, circa 1920. (Photograph taken from photograph from Deborah A. Archeski Davis, "White Haven, A Historic Overview," 5 May, 1992, term paper).

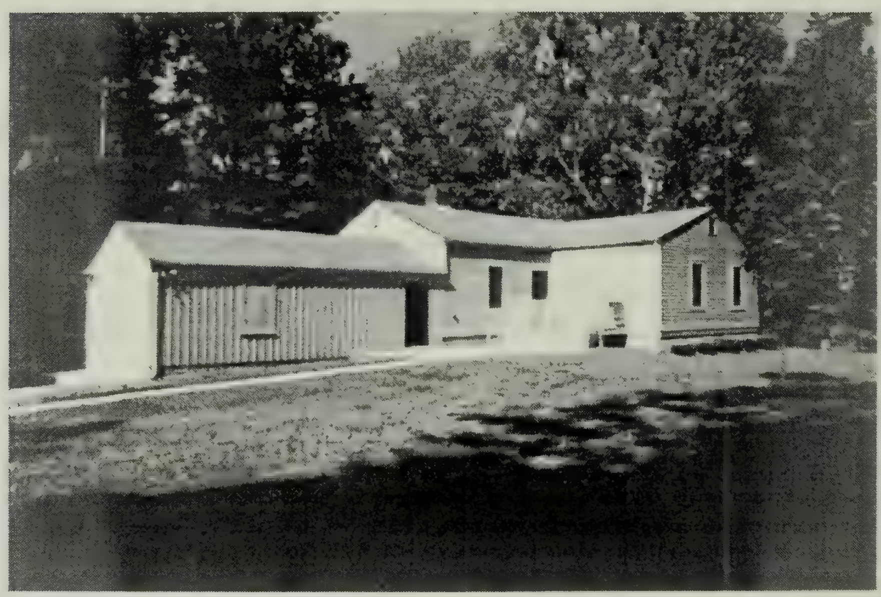

Figure 7.4 - The Cottage from the southeast, May 1994. The Cottage was extensively renovated during the 1940s after a fire, and is currently used as park administrative offices. At the left is the garage wing added in the 1940s. The bedroom wing, now used as an office, was added during the 1970s. (Photo by the author, ULSG collections).

by NPS day labor crews it was discovered that much of the structure was constructed of salvaged lumber from other sources. It is believed that demolished site structures or the Grant barn wings furnished some of the lumber during initial construction of the house or to repair fire damage.

What is thought to be a concrete septic tank was discovered about 60 feet north of the Cottage in June 1993. It is believed that the tank serviced the Cottage until the site was placed on public sewer lines during the 1960s. A portion of the ground surface above the tank has subsided.

It is recommended that this structure continue to serve as park office space until such time that its disposition is resolved with the approval of a general management plan. The building has no nineteenth century integrity save for the salvaged lumber used in its construction, but is in good condition. All utility systems have been replaced, interior finishes repaired, and the exterior envelope tightened. A handicap access lift was installed in 1993, and the garage and breezeway adapted as general storage. In 1995 the garage was renovated for curatorial storage space, and the breezeway renovated for use as an office.

Cottage Cistern

There is a cistern at the east side of the Cottage now concealed by a concrete and flagstone slab. Until early 1995 it was believed that the cistern was constructed with the Cottage around 1914. The cistern provided wash and sometimes drinking water for the Davis family until the site was furnished with public water service.[26] Water was drawn with a chain pump[27] and later by an electric pump into the Cottage basement. While Bill Wenzlick contends that the cistern was constructed at the time the Cottage was built, evidence suggests that it is of nineteenth century origin, and may have been associated with the log barn that stood nearby since at least 1818 (see Cow Barn). In March 1995, a small area of the concrete cap failed above the cistern opening as a result of nearby construction activities. A larger hole was opened to investigate and document the cistern. The cistern is 16 feet in depth, 8 feet 4 inches in diameter, and lined with limestone faced with a mortar coat. No mortar was found in joints between the stones. A cone-shaped brick cap tops off the cistern just below the concrete and flagstone slab. When opened, the cistern had four feet of water and one foot of mud at the bottom. At this writing intentions are to fill the cistern with sand as a safety precaution.

Cow Barn (Demolished)

There apparently was a hip roofed barn formerly located in the area now occupied by the Cottage. The barn is graphically documented only in an 1875 Frank Leslie engraving of the site (Figure 2.6, Division II). That barn probably predated construction of the Grant-ordered barn (circa 1868) and may have served to stable cows and horses.

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[26] James Davis to the author, 18 March, 1993. Davis contends that the cistern may have been in existence prior to construction of the cottage. The cistern was used by his mother until the water became brackish, necessitating the use of water from the barn well. During the 1920s and 1930s the cistern cap was smooth concrete and used as a "grandstand" during baseball games.

[27] Bill Wenzlick to the author 2 November, 1992. A galvanized steel pipe extends from the bottom of the cistern to the southeast corner of the Cottage basement.

In an 1818 letter from Ann Lucas Hunt to her father, she described "...a new hewn log Barn 26 feet by 20' with sheds all around, 14 feet wide..."[28] With sheds at all four sides, the barn had a footprint dimension of about 54 feet by 48 feet, very close to the size depicted in the Leslie drawing.

In an 1846 advertisement offering the site for sale by Frederick Dent, a "large stable" is listed as one of the structures.[29] It cannot be confirmed that the structure in the advertisement is in fact the one that appears in the 1875 engraving because that same ad also lists other "barns" on the property.

There were exposed remains of a stone foundation at about the location of the present garage attached to the Cottage and its associated driveway approach. The top of the stone was level with the ground and measured about 20 feet square.[30] It is very possible that these stone foundations were the remains of the of the log core structure of the barn mentioned by Ann Lucas Hunt. None of the foundations is exposed at present, but foundation stones may yet exist beneath the drive and garage. It is recommended that any work involving ground disturbance in and around the garage be carefully monitored for the presence of any stone foundation remains.

Culverts

The existing cast concrete culvert near the northeast corner of the site was installed during the 1960s and 1970s to direct the flow of the Prairie Spring beneath Whitehaven Drive and several Grantwood Village properties.[31] The culvert is covered with soil and vegetation.

There are two culverts beneath the railroad bed at the northwest corner of the site although they are part of the railroad right-of-way and not within the site boundaries. The cast concrete culvert was probably installed around 1920, and the corrugated steel culvert during the 1950s to prevent recurrent flooding of upstream property.

A stone culvert may exist beneath the west drive entry drainage ditch about twenty feet west of the fence within the railroad right-of-way. Portions of the south face are exposed. It is unknown when this feature was constructed but there is the possibility that it is of nineteenth century origin. This culvert is obstructed as evidenced by the frequent ponding and slow drainage of rainwater.

Bill Wenzlick recalled that an arched brick culvert measuring about four feet in height was found near the southeast corner of the existing property when the house at the end of Fernald Drive was constructed around 1964. An end of the culvert began at the existing cul-de-sac (before it was constructed) and continued across the adjacent property to parallel the lie of the railroad bed.[32] It is unknown when the culvert was constructed or if any of it remains within the property lines of the historic site.

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[28] Ann Lucas Hunt, Letter to J.B.C. Hunt, 28 January, 1818, Lucas Family Papers, Missouri Historical Society, St. Louis, Missouri.

[29] "Improved and Unimproved Land for Sale," *Missouri Republican*, 5 August, 1846.

[30] James and Charles B. Davis to the author, 18 March, 1993. The stone foundations were about flush with the grade as the brothers recalled being able to push a lawn mower over the top of the stones.

[31] Joseph P. Bannister to Glen Yanagi, 8 July, 1995. Bannister indicated that the culvert beneath his property at 9047 Whitehaven Drive, was installed at his expence in 1972 to prevent flooding on his yard.

Dam

Remains of a shallow concrete dam lie in the bed of the Prairie Spring, northwest of the Ice House. According to Bill Wenzlick the dam was installed during Albert Wenzlick's ownership to provide a small pool of drinking water for livestock when two natural ponds east of the house dried up during the summer. The dam is believed to have been constructed by Charles B. Davis sometime around 1920.[33]

Drain Pipe

A vitrified clay drain pipe begins near the large masonry fountain, follows the south drive, and terminates at the Prairie Spring. The pipe was installed between 1914 and 1920 by site caretaker Charles B. Davis to buffer the effects of heavy rains which at one time washed through a ravine south and east of the house.[34] The pipe line was extended between 1960 and 1965 when the western portion of the creek was rerouted to its present location. The pipe has a 16 inch interior diameter at its outflow into the creek.

It is believed that installation of the pipe allowed concealment of a natural spring or wet season creek which is thought to be represented as a depression spanned by a small plank bridge in an 1875 lithograph of the property (Figure 2.5, Division II). The pipe remains active in draining the site especially during heavy and long period rains. Depressions in the grade along the south drive and north of the drive indicate that soil is washing through joints or holes in the pipe.[35]

The drain pipe should remain in place until such time that recommendations are carried out though an approved cultural landscape plan. Until then the pipe should be probed to uncover sub-surface voids. Any voids and depressions should be backfilled with gravel and covered with top soil to prevent accidental injury to persons or damage to vehicles.

Fence

The earliest graphic representations of the house, dating to 1840, depict a picket fence parallel to the drive in front of the house (Figures 2.1 and 2.2). Fence lines are also depicted east and west of the house, and east of the Stone Building. A pedestrian gate with spherical finials gave entry to the house walkway. The picket style fence also shows in later engravings (Figures 2.3, 2.4, and 2.8).

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[32] Bill Wenzlick to the author, 17 June, 1993. Wenzlick directed a bulldozer operator to follow the apparent route of the culvert but gave up after tracking about 120 feet of it.

[33] Bill Wenzlick to the author, 15 March, 1993.

[34] Bill Wenzlick to the author 2 November, 1992. At that time there were few trees in the area of the ravine which was eventually backfilled during subdivision development. James Davis stated during an 13 April, 1993, interview with NPS Landscape Architect Mark Weekly, that soil was removed east of the Stone Building to fill the ravine in front of the house. Davis recalled that, at times, there was two feet of water in the ravine.

[35] A car wheel collapsed the ground surface above one sub-surface void in 1992.

The best photo documentation of the fence surrounding the house occurs in Figure 2.3. Here the image of a wooden rail fence is clearly shown running parallel to the drive south of the house. The fence corners at the drive turn and continues perpendicular to the south fence line. Using Figure 2.3 as a field guide, it has been determined that the squared fence posts were spaced 6 feet on center. What is believed to be a gate is also seen in front of the house at about where the walk to the house should have been. A small portion of the same type of fence can be seen in a 1913 photograph (Figure 2.13). The fence in that photograph was placed approximately between 30 feet and 40 feet from the east elevation of the house.[36] The rail fence is also portrayed in the 1875 engraving of the site (Figure 2.5). But a picket fence is also shown extending between the Stone Building and Ice House in that engraving. In Figure 2.9 the rail fence is shown just east of the East Wing.

It is believed that the rail fences were removed during Albert Wenzlick's ownership of the property. The posts may have survived into the 1930s.[37]

The existing chain link fence was installed around 1960 by Bill Wenzlick.[38] The south fence line was moved north a few years later after Bill Wenzlick and his wife purchased the land south of White Haven for development of several tract homes. The Whitehaven Drive gate featured a home made automatic opener which could also be controlled from the house. During Summer 1992 an emergency vehicle gate was added at the cul-de-sac, a break-away fence section stretched across the Prairie Spring at the west property line, and a barrier fence added to the concrete culvert just north of the Chicken House. The fence is stable although very rusted. Each of the west and east gates have had to be repaired several times. Although the existing fence protects the site from casual unauthorized entry, the draft general management plan proposes replacing the fence with a less industrial-looking fence, more sympathetic with site character.

Flag Staff

A flag staff at the west yard of the Main House was fabricated and installed by Bill Wenzlick around 1950 from steel pipe stored in the barn.[39] It still functions as the park flag staff, but it is in poor condition.

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[36] 36. The distance was judged using the 1890 photographic image of the house. In Figure 2.10 the rail fence cannot be seen so it is assumed that the photographer stood within the fence line. By juxtaposing existing building elements with those found on the photo it was determined that the photographer stood about 30 feet east and 35 feet south of the southeast corner of the front porch.

[37] 37. James and Charles Davis to the author, 18 March, 1993. The Davis and Wenzlick family children rode a kind of go-cart they called a "struggle buggy," which was constructed from a horse-drawn buggy undercarriage. The buggy was hand pushed up the hill east of the house and propelled by gravity to the railroad bed. According to the Davis brothers the buggy was deliberately steered at fence posts located just southeast of the house to knock them over.

[38] 38. Bill Wenzlick to the author, 2 November, 1992. The fence was purchased from Jim Powers of Anchor Fence Co.

[39] 39. Bill Wenzlick to the author 2 November, 1992. Wenzlick does not recall any flagpole on the site prior to this one.

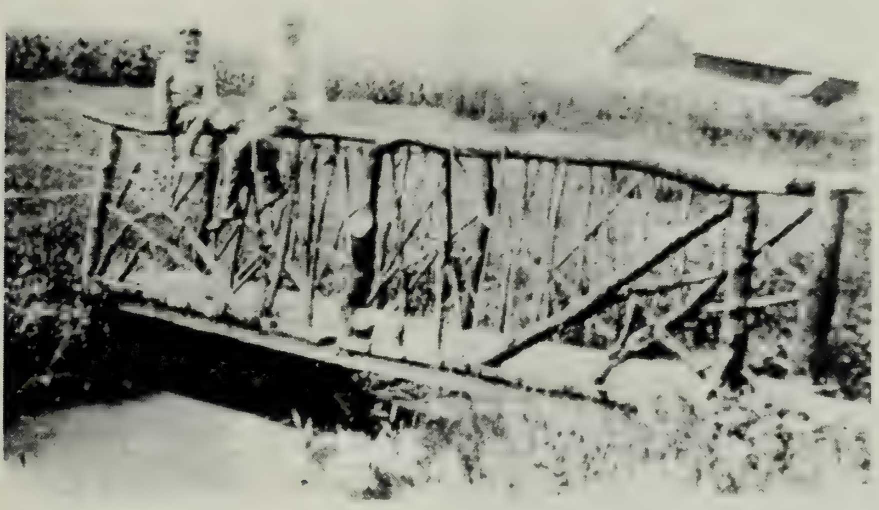

Figure 7.5 - Footbridge across Prairie Spring, circa 1920s. Note the large hay barn in the background. (Photograph taken from photograph from Deborah Archeski Davis, "White Haven, A Historic Overview," 5 May, 1992, term paper).

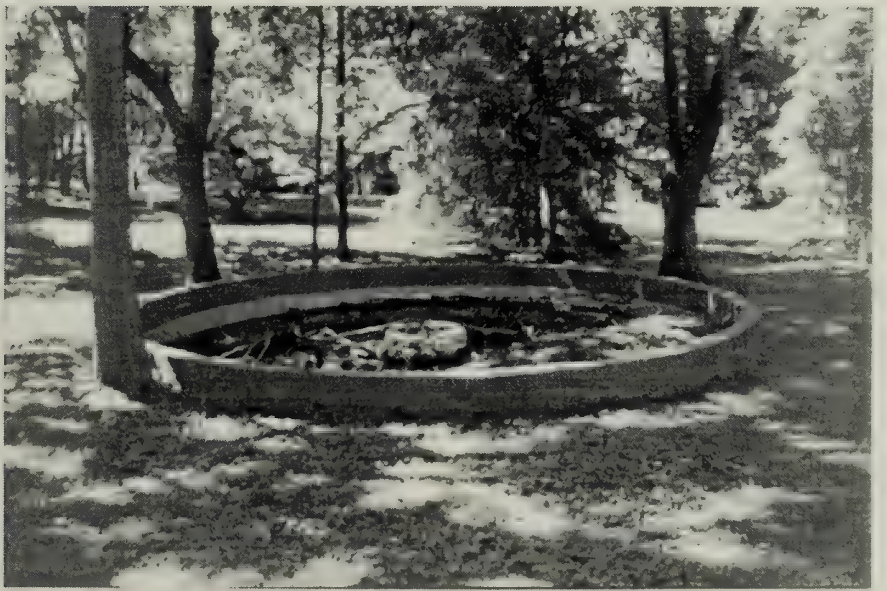

Figure 7.6 - Large brick fountain, May 1994. The fountain was constructed to serve as a cooling pond for the Main House air conditioning system. (Photo by the author, ULSG collections).

Foot Bridge

A rustic foot bridge crossed the Prairie Spring during the 1920s or 1930s. The only documentation for the bridge is in a photograph in the Davis family photo collection (Figure 7.5).[40] The bridge was constructed of small saplings which formed a trussed railing, and had a span of about 15 feet. Nothing else is known about the bridge, including its precise location.

Fountains

There are two brick and concrete fountain on the site. The largest is located southeast of the Main House and served to water cool the air condition coils in the house (Figure 7.6). This round pool was constructed around 1952 to replace a small stone pool that served the same purpose since 1940.[41] The smaller pool is located just east of the Stone Building and served the Workshop air conditioning system when it was constructed around 1950. The pools are deteriorated and partially filled with stagnant water. They should be removed and the resultant depressions backfilled.

There was a small kidney shaped stone pond southeast of the Main House and south of the present driveway. The manmade pond was part of a fenced garden maintained by Albert Wenzlick's wife. There are no apparent above ground remains or depressions.

Grave Sites

It is unknown if any nineteenth century grave sites exist within the confines of park boundaries. However there are twentieth century grave sites of the remains of two individuals. The cremated remains of Lou Felice, husband of Bill Wenzlick's cousin Marjorie Abbot Felice, are believed to have been buried in an urn somewhere on the site by Delbert Wenzlick and Sam Stewart around 1960.[42] Delbert Wenzlick's cremated remains were buried in a cardboard box at the end of the Main House flagstone walk across the driveway soon after his death in 1979.[43]

Hay Barn and Stable (Demolished)

A large stable and/or barn once existed approximately 150 yards directly north of the Main House on what is now a housing tract. A small portion of the barn is seen in Figure 2.17 just to the right of the Main House. In a photo taken of a foot bridge during the 1910s, the same barn can also be seen (Figure 7.5). The barn was clearly on Dent and Grant property. Its construction date is unknown but there is an early nineteenth century reference by Emma Dent Casey that in 1843 there were "...stables and pens for the stock..." located "...some little distance behind the house..."[44] This structure could also have been listed in an 1846 real estate advertisement for the property (See Cow

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[40] Deborah Archeski Davis, *White Haven: A Historic Overview*, (5 May, 1992). The bridge photo appeared in this classroom paper.

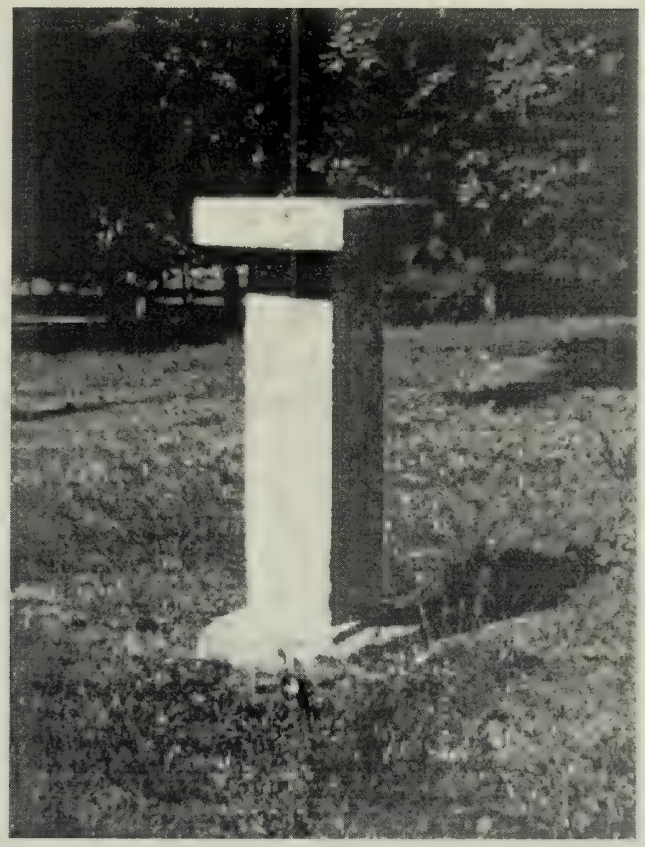
[41] The earlier stone fountain can be seen in movies taken during the 1940s by the Wenzlicks.

[42] Bill Wenzlick to the author, 2 November, 1992. Louis died and was cremated in Florida. His remains were mailed to Delbert for internment.

[43] Bill Wenzlick to the author during several informal conversations.

[44] Casey, *Grant*, 1.

Figure 7.7 - Sundial pedestal, May 1994. Constructed of concrete, this pedestal was placed on the site between 1927 and 1929. (Photo by the author, ULSG collections).



Barn). An account related by Mrs. John C. Dent in 1916 seems to describe this building as being a slave quarters, but the narrative is garbled.[45]

James Davis recalled that this structure was used to store hay, but it was demolished between 1921 and 1923 because it was in very poor condition.[46] The structure may also have been demolished under the direction of Albert Wenzlick in preparation for development of the Forest Haven housing subdivision. Archeological remains were most likely obliterated when extensive grading was performed in preparation for road and housing construction.[47]

James Davis also recalled stories of a barn being located some distance east of the Main House, but it was demolished by the time he was born in 1913.[48] There is no other documentation for that structure.

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45. "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 34. See Division III - Stone Building, Architectural Analysis, for clarification.

46. James Davis to the author, 18 March, 1993.

47. Bill Wenzlick to the author, 2 November, 1992. While Wenzlick could not remember any structure across the creek from the house (probably because it was demolished about the time he was born), he intimated that almost 20 feet of earth had been graded from the area.

48. James Davis to the author, 18 March, 1993.

Lime Kiln (Demolished)

Although a lime kiln probably never existed within the present historic site boundaries for practical reasons, there is documentation that one was constructed under Grant's orders. In a November 24, 1870, letter to White Haven farm tenant William Elrod, Grant writes that "...I want a Lime kiln built..."[49] Although no reason for its construction is offered, later correspondence indicates that the produced lime was used for agricultural purposes.[50] The kiln location is unknown at this writing.

Pedestal

An unadorned cast concrete pedestal is located just west of the Main House (Figure 7.7). The pedestal is believed to have been constructed by site caretaker Charles B. Davis and a sundial by Albert Wenzlick's son Roy between 1927 and 1929.[51] The sundial is no longer extant. The pedestal should be removed from the site as it has no nineteenth century integrity.

Pig Sty (Demolished)

There was a pig sty located at the southwest corner of the former location of the extant Barn. While there is no documentation as to its appearance (other than filthy), Charles B. Davis indicated that pigs continued to be raised as a source of meat for the Davis and Wenzlick families.[52] It is unknown when the sty was established but it is believed that the sty was abandoned and perhaps left to decay prior to 1940.

Privies

Given that the site was occupied for at least 100 years prior to the installation of sewage handling systems by Albert Wenzlick around 1914, it is logical to expect the presence of numerous privy pits around and especially to the rear of the Main House. Other than the Barn privy described in Division IV, only one other privy is documented. James Davis vaguely recalled the existence of a privy about 50 feet east of the Main House, although he could not be more descriptive.[53] On the title sheet of the 1940 HABS drawing set an unidentified small square was drawn approximately 50 feet east of the northeast corner of the Stone Building. It is unknown if the square represents the privy remembered by James Davis or some other structure. The ground surface is slightly depressed in that area however. Exploration with a probe by archeologist Jim Price in April 1995 revealed the presence of a masonry foundation surrounding the depressed area.

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[49] Fisher, *Grant's Letters*, 26-42, 34.

[50] Fisher, *Grant's Letters*, 35 and 36. The letters mentioning lime use are dated 23 June, 1871, and 15 March, 1872.

[51] Bill Wenzlick to the author, 2 November, 1992, and James Davis to the author, 18 March, 1993.

[52] Charles B. Davis to the author, 18 March, 1993. On slaughtering day the pigs, weighing as much as 700 pounds, were shot and placed in a 55 gallon pot of boiling water to facilitate the removal of body hair. The carcasses were then hung from the adjacent corn crib to be gutted, cleaned, and dried. Some of the meat was taken to the smokehouse (now referred to as the Ice House (HS-4)) for smoke curing, and some was taken to the stable jack room in the loft of the barn for sugar curing according to Davis. The stable jack room was used for that purpose as it was out of reach of carnivorous animals.

[53] James Davis to the author, 18 March, 1993.

Shed

In Figure 2.5 there is an image of an outbuilding strikingly similar in appearance to the present Chicken House (HS-5) (See Division VI). However, doubts have been raised as to whether the image is actually the existing Chicken House moved to its present location, or if the shed had been torn down by the time Albert Wenzlick purchased the property. The structure stood just north of the cow barn in the engraving, or in the area now occupied by the Cottage; its exact function is unknown but believed to have served as a shed or granary. Its date of construction is unknown.

Slaves Quarters (Demolished)

While it is known that the Dent's kept slaves, there is little documentation on how or where they held residence. An 1818 description of some of the property's early structures by Ann Lucas Hunt indicates that there were "...several good log cabins...", but gives no other information as to how the cabins were used or where they were located.[54] An 1846 real estate advertisement offered "negro quarters" among other structures when Frederick Dent sought to sell the property.[55]

One account of nineteenth century White Haven life written or dictated by Julia Grant's sister Emma Dent Casey mentions slaves quarters. In the manuscript she indicates that there were "...eighteen cabins where our slave people lived" and located "Some little distance behind the house..." flanking a stable on either side.[56] There is no other description of the appearance of the building, although they must have been simple wood frame or log structures.

Mrs. John C. Dent cryptically describes the slaves quarters as a single structure "...with lower rooms and attics above," but the article fails to clarify exactly to what structure she referred to.[57]

In a letter to site caretaker William Elrod, Grant writes:

> Besides a number of cabins on my place, which by the way I have directed shall all be pulled down, there are three good houses.[58]

It cannot be determined for certain if the "cabins" Grant mentions are in fact slave, squatter, or hired hand quarters, but in a letter directed to Elrod just three days later, Grant once again mentions "...about dozen log cabins.." which he orders to be torn down.[59] In any event, the slaves quarters are believed to have been demolished by the time Albert Wenzlick purchased the property in 1913,[60] but some remains of the structures may have survived into the 1920s.[61] If the cabins were located about 200 yards north of Main House as suspected, there probably are no archeological remains as substantial earth moving work was performed when the land was developed for housing during the 1950s.[62]

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[54] Ann Lucas Hunt, Letter to J.B.C. Hunt, 28 January, 1818, Lucas Family Papers, Missouri Historical Society, St. Louis, Missouri.

[55] KSL, *White Haven*, 62.

[56] Casey, *Grant*, 1-2.

[57] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," 34.

[58] USG, Papers, 17:27. The letter is dated 15 January, 1867. The three houses to which he refers are White Haven, Hardscrabble, and Wish-ton-wish.

[59] USG, *Papers*, 17: 28. Grant also ordered that "...one or two..." of the cabins be moved up for living quarters, presumably for hired laborers. "They have windows, doors, floors &c. so that it would take but a short time, with help, to make you quite comfortable."

Spring house (Demolished)

In a newspaper article written three years after Albert Wenzlick purchased the site, a ruined spring house is shown in a photograph and mentioned in the text. The entire content of the article pertaining to the spring house is transcribed here:

> Down the hill are the ruins of the springhouse, the nearest substitute for an ice chest which the times allowed. From the cool spring here the water for household uses was carried up the hill by diligent pickaninnies. Milk and butter were kept in crocks sat in streams of the cool water. Mr. [Albert] Wenzlick is planning to rebuild the springhouse as nearly as possible on its old lines. Mrs. Dent hopes that he may be able to revive the spring, although it appears now to be completely dried up.[63]

From the description offered by the photograph and text, the spring house was at the south bank of the Prairie Spring. The structure was relatively small, about the footprint size of the extant Ice House, and walls were constructed of rubble stone. The spring house appears almost completely leveled in the 1916 photo. There are no existing visible remains for this structure. James Davis recalled the approximate location for the structure based upon the relationship of the spring house site with extant structures. He placed the structure approximately 20 yards east of the existing concrete culvert opening located directly north from the Chicken House. Construction of the earth covered culvert may have buried or disturbed any remains of the structure.[64]

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[60] Marjorie Abbott Felice, Letter William Bodley Lane, 5 August, 1987, ULSG files; and Bill Wenzlick during informal interviews with the author; and James Davis to the author, 18 March, 1993. Wenzlick contends that the slaves quarters were located near the creek bed adjacent to the railroad although he could not remember actually seeing them intact. His location contradicts other sources indicating that the cabins were north of the house beyond the creek. Davis could recall no slaves cabins when he lived at the site from 1913 until 1937.

[61] "The Home in which Gen. Grant Courted and Lived is Still a Staunch Structure," *St. Louis Globe-Democrat Magazine*, 4 November, 1928, 15.

[62] Bill Wenzlick to the author, 2 November, 1992. Almost 20 feet of earth had been graded from the area.

[63] "Scene of Gen. Grant's Courtship-A Hidden Spot of Interest," *Historic Houses of Missouri*, Vol. I, 8 December, 1916. 35. Unfortunately the photograph of the ruins is not reproducible for this document.

[64] James Davis to the author, 18 March, 1993; and "The Home in which Gen. Grant Courted and Lived is Still a Staunch Structure," *St. Louis Globe-Democrat Magazine*, 4 November , 1928, 15. According a story recounted to James Davis, water emanating from the spring was very good, but the flow rate was very low. Albert Wenzlick desired to increase the flow rate, so he enlisted the aid of Charles B. Davis to assist in dynamiting the spring vein. After the explosion the spring virtually ceased to flow and the water that did issue from the spring was putrid. A significant side effect of the explosion may have been the near total destruction of the spring house. The *St. Louis Globe-Democrat Magazine* article confirms James Davis's spring house destruction account, and does not provide details of who was responsible, but the article does offer that Albert Wenzlick "...found [the spring house] had been destroyed by a charge of dynamite..."

Early documentation for this structure is believed to occur in an 1846 real estate advertisement offering the property for sale. The ad records "...smoke and dairy houses of stone..." which could be applied to a spring house, but no specific description is provided.[65] One twentieth century account claims that the spring house floor had been paved in brick however.[66] It is possible that the spring house, Ice House, and Stone Building were constructed at about the same time given their apparent similarity of construction.

The reason for mention of this structure is to clarify confusion over whether the ruins shown in the newspaper article were the present day Ice House, or in fact a totally separate structure. Since the 1916 newspaper article intimated that Albert Wenzlick had wanted to rebuild the ruined structure, there was speculation that the Ice House may have actually been the reconstructed spring house.

Store House

In Julia Dent Grant's memoirs she relates how food and other consumables were rationed out to the slaves:

> "Molasses, tobacco, and some whiskey (on cold, raw days) were issued regularly to them from the storehouse..."[67]

While it appears that Julia was referring to a separate building rather than a "storeroom," it is only speculative as to what building she was referencing. Storage of food items usually requires that the space be cool in the summer, yet protected from freezing during the winter. Perhaps she was referring to the cooling room in the Ice House, the root cellar in the Main House, one of the rooms in the Stone Building, or even another building for which there is no documentation.

Summer Cottage

Bill Wenzlick recalled that his grandfather, Albert, constructed a summer cottage for Albert's sister, Ruth Abbott, east of the Stone Building around 1930.[68] The building was about 12 feet square, had vertical beaded board siding, and was painted white. Ruth used to building to meditate after her husband died as a result of injuries suffered in World War I. The summer cottage was demolished during the 1940s, and there are no known photographs of the structure. In April 1995, archeologist Jim Price probed for and found a foundation of the approximate footprint stated by Wenzlick located about 30 feet south of the Workshop and 30 feet east of the Stone Building. He said that his grandfather, Albert, built his aunt Ruth Abbott a summer cottage to the east of the Stone Building about 1930. The building was about 12 feet square, had vertical beaded board siding, and was painted white. Ruth used to building to meditate after her husband died as a result of injuries suffered in World War I. The building was demolished during the 1940s. Jim Price probed for the foundation two weeks ago and may have found it.

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[65] "Improved and Unimproved Land for Sale," n.p.

[66] "The Home in which Gen. Grant Courted and Lived is Still a Staunch Structure," *St. Louis Globe-Democrat Magazine*, 4 November, 1928.

[67] JDG, *Memoirs*, 34.

[68] Bill Wenzlick to the author, 25 April, 1995.

Tennis Court

A grass tennis court was laid out about 120 feet east of the former location of the Grant-ordered barn. Apparently the grade had been leveled in the area to accommodate the playing surface. The court is believed to have been installed by Albert Wenzlick but later reverted to horseshoe pits.[69] There is no longer any physical evidence indicating the precise location of the court.

Tunnel

Walter Grogan, now residing in Illinois, recalled crawling through a wood-lined tunnel connecting the Main House basement with the "smoke house." Grogan visited the site during the 1920s at the age of four or five.[70] There is no physical evidence of a tunnel opening in the basement, nor has any archeological evidence been uncovered for the existence of a tunnel.

Walkway

One eyewitness recalled that prior to 1940 there was a flagstone walkway between the Main House Hunt Addition and the Stone Building which led to the East Wing.[71] A portion of the flagstone walkway was uncovered during archeological excavations of the Hunt Addition in April 1995. The flagstones are placed parallel and adjacent to the historic west elevation of the Stone Building, and veer west at a right angle just in front of the north elevation of the Hunt Addition. In a 1940 HABS photograph there is a poured concrete walk against the north elevation of the Hunt Addition (Figure 2.29). Installation of the concrete walk resulted in removal of the flagstones.

West Gate Pillars

Two massive brick pillars flank each side of the west gate entrance to the site (Figure 7.8). The pillars are believed to have been constructed by Charles B. Davis in the late teens or early 1920s concurrent with the paving of driveway with concrete.[72] The pillars should be removed upon construction of a new fence.

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[69] Bill Wenzlick to the author, 17 September, 1992. Early movies taken by the Wenzlicks show the court.

[70] Walter Grogan to the author, 9 June, 1995. Grogan (born 1916) is the son of Emma Wenzlick's (Albert's Wenzlick's wife) first cousin. Grogan recalled seeing meat hanging in the smoke house, or what is now called the Ice House (HS-4).

[71] Doris Gault to the author, 18 October, 1994. Gault is the elder sister of Bill Wenzlick.

[72] Bill Wenzlick to the author, 2 November, 1992.

Wishing Well (Demolished)

A small stone wishing well was constructed in the west front lawn during Albert Wenzlick's ownership by Charles B. Davis.[73] It is believed that the well was constructed for decorative purposes only and did not have an active pit.

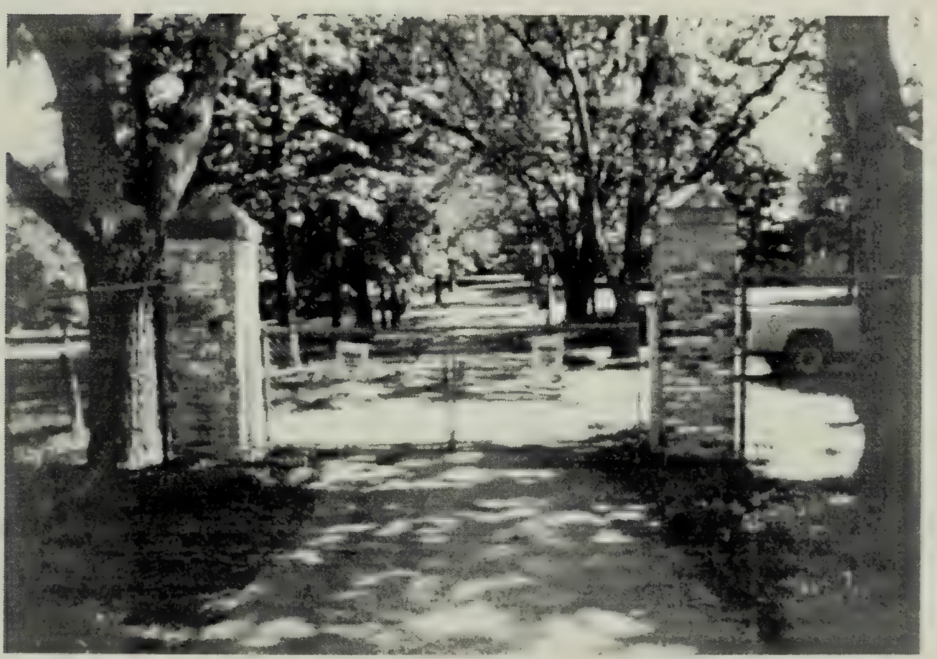

Figure 7.8 - West gate pillars and gate looking east toward the Main House, May 1994. (Photo by the author, ULSG collections).

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[73] Bill Wenzlick to the author, 17 September, 1992. The well is seen in 1920s movies taken of the site.

APPENDIX A - WOOD IDENTIFICATION

Seventy-eight wood samples were removed from structural members, windows, doors, sheathing, floors, lath, and millwork in the Main House, Stone Building, Ice House, Chicken House, Barn, and salvaged millwork during 1991 and 1992. The bulk of these samples were analyzed by the Forest Products Laboratory, Madison, Wisconsin to identify specie. The purpose of this analysis was to; comparatively date early building construction episodes in association with other information, determine specie which is important in structural loading analysis, assist in the identification of 1940 renovation work, and ensure compatible species are used in the repair of millwork. The following schedule identifies the sample reference number, structure from which the samples were taken, specific description from where sample was taken, date sample was taken, and the analyzed specie.

WOOD IDENTIFICATION SCHEDULE

MARK	BUILDING	DESCRIPTION/LOCATION	DATE	SPECIE
W-103S- 01	MAIN HOUSE	WEST STYLE, LOWER SASH, WINDOW 103-W1	6/24/91	Yellow pine
W-204- 02	MAIN HOUSE	WEST GABLE SIDING, ATTIC 204	4/14/92	White pine
W-204- 03	MAIN HOUSE	WESTERN MOST RAFTER, NORTH ROOF LEAF, ATTIC 204	4/14/92	Red oak
W-204- 04	MAIN HOUSE	JOIST 3, ATTIC 204	4/14/92	White oak
W-204- 05	MAIN HOUSE	PLASTER STIFFENER BETWEEN JOISTS 1 & 2, ATTIC 204	4/14/92	White oak
W-204- 06	MAIN HOUSE	ROOF SHEATHING, NORTH LEAF, ATTIC 204	4/14/92	White oak
W-204- 07	MAIN HOUSE	JOIST 6, ATTIC 204	4/14/92	White oak
W-204- 08	MAIN HOUSE	STUD SOUTH OF CENTER, WEST GABLE, ATTIC 204	4/14/92	White oak
W-101N- 09	MAIN HOUSE	GIRT, NORTH WALL, LIVING ROOM 101	4/27/92	White oak
W-101N- 10	MAIN HOUSE	STUD, NORTH WALL, LIVING ROOM 101	4/27/92	White oak
W-101W- 11	MAIN HOUSE	STUD, WEST WALL, LIVING ROOM 101	4/27/92	Tulip poplar
W-101W- 12	MAIN HOUSE	TOP PLATE, WEST WALL NORTH OF DUCT, LIVING ROOM 101	4/27/92	White pine
W-102N- 13	MAIN HOUSE	WEST CASING, DOOR 102-D2, JUST BELOW LOCK KEEPER	4/27/92	Yellow pine
W-102N- 14	MAIN HOUSE	BACK SIDE OF BASEBOARD, NORTH WALL, ENTRY HALL 102	4/27/92	Yellow pine
W-102W- 15	MAIN HOUSE	BASEBOARD SOUTH OF AIR DUCT, WEST WALL, HALL 102	4/27/92	White pine
W-102W- 16	MAIN HOUSE	1X4 STUD, WEST WALL OF ENTRY HALL 102 BENEATH S1	4/27/92	White pine
W-103W- 17	MAIN HOUSE	STUD, WEST WALL, DINING ROOM 103	4/27/92	N.C.
W-104N- 18	MAIN HOUSE	VERTICAL LOG AT NORTH WALL OPENING, BEDROOM 104	4/27/92	Red oak
W-104E- 19	MAIN HOUSE	VERTICAL LOG AT EAST WALL, BEDROOM 104	4/27/92	Red oak
W-104E- 20	MAIN HOUSE	SOUTH JAMB, DOOR 104-D1, THROUGH MORTISE KEEPER	4/27/92	Yellow pine
W-104BE-21	MAIN HOUSE	T&G BOARD BENEATH PLASTER, EAST WALL, CLOSET 104-B	4/27/92	White pine
W-201N- 22	MAIN HOUSE	STUD, NORTH WALL, ROOM 201	4/27/92	Yellow pine
W-201S- 23	MAIN HOUSE	WEST JAMB, WINDOW 201-W1	4/27/92	Yellow pine
W-201S- 24	MAIN HOUSE	WEST CASING, WINDOW 201-W1	4/27/92	Yellow pine
W-203S- 25	MAIN HOUSE	WEST CASING, WINDOW 203-W2	4/27/92	Yellow pine
W-203W- 26	MAIN HOUSE	STUD SOUTH OF FIREPLACE FP5	4/27/92	N.C.
W-203W- 27	MAIN HOUSE	BACKSIDE OF BASEBOARD, WEST WALL, BEDROOM 203	4/27/92	Yellow pine
W-208- 28	MAIN HOUSE	NORTH ADDITION ROOF SHINGLE	4/27/92	Redwood
W-208- 29	MAIN HOUSE	6TH CEILING JOIST, NORTH ADDITION ATTIC 208	4/27/92	Yellow pine
W-208- 30	MAIN HOUSE	NORTH ADDITION ROOF SHEATHING, ATTIC 208	4/27/92	White pine
W-301N- 31	MAIN HOUSE	2ND RAFTER FROM WEST, NORTH ROOF LEAF, ATTIC 301	4/27/92	Red oak
W-301S- 32	MAIN HOUSE	ROOF SHEATHING JUST WEST OF EAST DORMER, ATTIC 301	4/27/92	White pine
W-301W- 33	MAIN HOUSE	SOUTH JAMB, WINDOW 301-W1, ATTIC 301	4/27/92	Walnut
W-301W- 34	MAIN HOUSE	GABLE END SIDING, ATTIC 301	4/27/92	Redwood
W-102N- 35	MAIN HOUSE	DOOR 102-D3 FROM BENEATH RIM LOCK, ENTRY HALL 102	6/17/91	Yellow pine
W-103N- 36	MAIN HOUSE	DOOR 103-D4 FROM LATCH AREA, DINING ROOM 103	6/17/91	Yellow pine
W-104E- 37	MAIN HOUSE	DOOR 104-D2 FROM BENEATH RIM LOCK, BEDROOM 104	6/14/91	White pine
W-301F- 38	MAIN HOUSE	FLOOR BOARD AT EXHAUST FAN CUTOUT, ATTIC 301	2/20/92	Yellow pine
W-003C- 39	MAIN HOUSE	FP2, HEARTH SUPPORT BOARD, OFFICE 003	5/1/92	Bark
W-003C- 40	MAIN HOUSE	JOIST 6, OFFICE 003	5/1/92	White pine
W-003C- 41	MAIN HOUSE	SUB FLOOR OF ROOM 104 TAKEN AT CEILING OF OFF. 003	5/1/92	Yellow pine
W-003C- 42	MAIN HOUSE	FINISH FLOOR OF ROOM 104 TAKEN AT CEIL. OF OFF. 003	5/1/92	White pine
W-001C- 43	MAIN HOUSE	JOIST 2, NORTH BAY, TRAIN ROOM 001	5/1/92	White oak
W-001N- 44	MAIN HOUSE	WEST END OF FOUNDATION SILL, N. WALL, TRAIN RM 104	5/1/92	White oak
W-002BN-45	MAIN HOUSE	SILL, WINDOW 002B-W1, BATHROOM 002B	5/1/92	White pine
W-003S- 46	MAIN HOUSE	WEST SASH, WINDOW 003-W1, OFFICE 003	5/1/92	White pine
W-003BC-47	MAIN HOUSE	SUB FLOOR OF CLOSET 104 TAKEN AT CEIL. OF CL. 003-B	5/1/92	Yellow pine
W-204W- 58	MAIN HOUSE	TYPICAL HAND MADE SIDING ON TWO STORY PORTION	5/1/92	Red oak
W-204- 61	MAIN HOUSE	NORTHWEST CORNER TRIM, TWO STORY SECTION, ATTIC 208	5/4/92	Yellow pine
W-104E- 63	MAIN HOUSE	TOP STYLE, DOOR 104-D1	5/5/92	Yellow pine
W-102S- 64	MAIN HOUSE	TOP STYLE, DOOR 102-D2	5/5/92	White pine
W-102W- 65	MAIN HOUSE	HEAD TRIM, DOOR 103-D1	5/5/92	Yellow pine
W-002C- 66	MAIN HOUSE	ORIG. SKIRT BOARD AT FOUND. SILL, CEIL. OF 002C	5/5/92	Yellow pine
W-003C- 70	MAIN HOUSE	JOIST 6, SOUTH CEILING, OFFICE 003	8/26/92	N.A.
W-003C- 71	MAIN HOUSE	JOIST 3, NORTH CEILING, OFFICE 003	8/26/92	N.A.

WOOD IDENTIFICATION SCHEDULE (CONTINUED)

MARK	BUILDING	DESCRIPTION/LOCATION	DATE	SPECIE
W-SB- 62	STONE BLDG	BOTTOM STYLE, DOOR D-1	5/5/92	White pine
W-OBA- 48	OUT BLDG A	3RD RAFTER, EAST ROOF LEAF, UPPER LEVEL	5/1/92	White pine
W-OBAF- 49	OUT BLDG A	18" WIDE FLOOR BOARD, UPPER LEVEL	5/1/92	White pine
W-OBA- 59	OUT BLDG A	DOOR AT SOUTH ELEVATION, LOWER MIDDLE RAIL	5/4/92	Yellow pine
W-OBA- 60	OUT BLDG A	DOOR AT SOUTH ELEVATION, LOWER EAST PANEL	5/4/92	Yellow pine
W-OBB- 50	OUT BLDG B	4X4 POST, NORTHEAST CORNER	5/1/92	Red pine
W-OBBE- 51	OUT BLDG B	VERTICAL BOARD SIDING, WEST INTERIOR WALL	5/1/92	White pine
W-OBBF- 52	OUT BLDG B	LOFT FLOOR BOARD	5/1/92	White pine
W-OBB- 53	OUT BLDG B	FLOOR JOIST	5/1/92	White pine
W-BARN- 54	BARN	NORTH BAY POST	5/1/92	Yellow pine
W-BARN- 55	BARN	LOFT JOIST	5/1/92	Yellow pine
W-BARN- 56	BARN	RAFTER, 18TH FROM SOUTH, EAST ROOF LEAF	5/1/92	Yellow pine
W-BARN- 57	BARN	VERTICAL BOARD SIDING, WEST INTERIOR WALL	5/1/92	White pine
W-SALV- 67	UNKNOWN	3' WENZLICK BASEBOARD FOUND IN WORKSHOP ATTIC	5/28/92	Douglas fir
W-SALV- 68	UNKNOWN	BASE PIECE, SALVAGED CHAIR RAIL, POSSIBLY HUNT ADD.	6/24/92	White pine
W-SALV- 69	UNKNOWN	BASE PIECE, SALV. DOOR EXT CASING, POSS. HUNT ADD.	6/24/92	White pine
L-002AW-01	MAIN HOUSE	AT ELECTRIC SWITCH BOX, WEST WALL, STAIR 002-A	2/27/92	White oak
L-101C- 02	MAIN HOUSE	CEILING UNDER CHIMNEY GIRT, 3' FROM SOUTH WALL	2/27/92	White oak
L-101W- 03	MAIN HOUSE	CEILING ABOVE WEST WALL NEAR SUMMER BEAM, LV RM 101	2/27/92	White oak
L-104E- 04	MAIN HOUSE	AT ELECTRICAL SWITCH BOX, EAST WALL, BEDROOM 104	2/27/92	White pine
L-106C- 05	MAIN HOUSE	CEILING ABOVE DOOR 104-D3, DRESSING ROOM 106	2/27/92	White pine
L-106C- 06	MAIN HOUSE	CEILING ABOVE WINDOW 106-W2, DRESSING ROOM 106	2/27/92	White pine
L-207C- 07	MAIN HOUSE	CEILING AT EDGE OF EXHAUST FAN, BATHROOM 207	2/27/92	White oak

SCHEDULE OF ABBREVIATIONS

ADD.	ADDITION
CL.	CLOSET
EXT	EXTERIOR
L	LATH
LV RM	LIVING ROOM
N.	NORTH
N.A.	NOT ANALYZED
OBA	OUTBUILDING A (ICE HOUSE)
OBB	OUTBUILDING B (CHICKEN HOUSE)
SALV	SALVAGED
SB	STONE BUILDING
T&G	TONGUE AND GROOVE
W	WOOD

APPENDIX B - WOOD DATING

Dendrochronology Study

A dendrochronology study was performed on fourteen wood samples removed from the Main House by Richard Guyette under the direction of William Bodley Lane for St. Louis County in 1987 (see enclosed copy of the report). The purpose of that study was to establish the relative dates of construction of the Long House and the West Wing. The apparent deficiency of documentary information on the chronological relationship of the Long House with the West Wing may have been the incentive for initiation of the study.

Concerns about the accuracy of the 1987 study were raised by the NPS. Specifically, several sample areas described in the report could not be located in the Main House, and therefore the precision of the methodology with which the samples were handled was in doubt. Further a comparison made between the then accepted construction date of the West Wing and the dendrochronology study did not coincide. The West Wing is of French Colonial, vertical log style of construction; a technique which survived as late as 1830. However, local tradition held that the West Wing predated construction of the Long House (then accepted as 1808). The 1987 study revealed that the structural timber in the West Wing were logged around 1832; very late for that style of construction.

In response to concerns over sampling methodology, and confusion between rumor and fact, radiocarbon 14 tests were performed on new samples removed from adjacent to three confirmed locations identified in the 1987 study. The purpose of the Radiocarbon 14 tests was to confirm, albeit strengthen, the validity of the 1987 dendrochronology study.

APPENDIX C - MORTAR AND PLASTER ANALYSIS

MORTAR

A total of forty mortar samples from Main House, Stone Building, and Ice House historic masonry work in 1992. These samples were analyzed for constituent materials and proportional mix by Architectural Conservator David Arbogast during May and June 1992. The purpose of the analysis was to; comparatively date early building construction episodes through variances in materials and mix, and develop a repair mix compatible with existing mortars. The accompanying mortar analysis schedule identifies; the sample reference number, structure from which the samples were taken, specific description from where sample was taken, date sample was taken, summarizes the analyzed sand/lime mix ratio, and attempts to classify mortar with regard to constituents and mix ratios.

Main House

In general the Long House and West Wing stone foundations and chimney stacks of the Main House are bedded in soil based mortar. It was found that the West Wing bed mortar contains one part lime to between two and four parts sand whereas the Long House mortars contain little if any lime. The analysis categorized the west chimney stack as a lime/dirty sand mix in proportions of one part lime to seven parts sand.

Pointing mortar consists of a lime/sand mix ranging in proportion of one part lime to between one and two parts sand. Pointing mortar was sampled only in the original two story portion of the house; little pointing mortar could be found in the West Wing foundation except for a small area of original tooled joint just east of window 003-W1 which must be preserved. Original pointing mortar may yet exist beneath portland cement mortar smeared across West Wing masonry surfaces.

Stone Building

Architectural Conservator David Arbogast analyzed four mortar samples removed from historic stone masonry. In general, all bed mortars were found to contain one part lime to between two and five parts of fine sand. The bed mortars in the Stone Building are distinct from those found in the Main House in that the house mortars predominantly consist of soil. The majority of the exposed surface joints throughout the Stone Building have been repointed with portland cement based mortar.

Ice House

Three mortar samples were collected from the Ice House in 1992 and analyzed by Architectural Conservator David Arbogast. Two of the samples, taken from opposite sides of the central wall, were found to have a mixture of approximately three parts of sand to each part of lime. The third sample, taken from the west wall of the south room, was found to contain approximately four parts of sand to each part of lime. When comparing the mortar samples taken from the various buildings on the site, it is found that the samples taken from the Ice House have a mix that is similar to that of the Stone Building but not to the Main House (refer to Divisions II & III, Materials Analysis). This finding leads to the assumption that the same person that built the Stone Building may have built the Ice House since both use a common lime/sand mix as opposed to the lime and dirt mix that is found in the Main House.

MORTAR SAMPLE ANALYSIS SUMMARY SCHEDULE BY GROUPING

MARK	BUILDING	DESCRIPTION/LOCATION	DATE	LIME/ SAND
LIME/SAND POINTING MORTAR				
M-FP2- 06	MAIN HOUSE	PARGE COAT, SOUTH FACE OF BREAST, FP2	2/28/92	1/4
M-204- 12	MAIN HOUSE	POINTING MORTAR, W. FACE, CHIMNEY, ATTIC 204	4/14/92	1/3
M-003E-16	MAIN HOUSE	POINTING MORTAR, CENTRAL CHIMNEY FOUND, OFFICE 003	4/30/92	1/2
M-002S-21	MAIN HOUSE	POINTING MORTAR, SOUTH WALL, MECHANICAL ROOM 002	4/30/92	1/1
M-002S-22	MAIN HOUSE	POINTING MORTAR, SOUTH WALL, MECHANICAL ROOM 002	4/30/92	2/3
M-002N-24	MAIN HOUSE	POINTING MORTAR, NORTH WALL, MECHANICAL ROOM 002	4/30/92	3/4
M-002N-26	MAIN HOUSE	POINTING MORTAR, NORTH WALL, MECHANICAL ROOM 002	4/30/92	6/7
M-002W-28	MAIN HOUSE	POINTING MORTAR, CENT. CHIMNEY FOUND, MECH RM 002	4/30/92	6/7
M-E- 38	MAIN HOUSE	POINTING MORTAR, EAST CHIMNEY STACK, EAST FACE	5/4/92	5/6
LIME LAYER				
M-FP5- 07	MAIN HOUSE	LAYER 6 1/4" BENEATH EXISTING HEARTH SURFACE, FP5	3/16/92	1/0
SOIL BED MORTAR				
M-204- 11	MAIN HOUSE	BED MORTAR, SOUTH FACE, CENTRAL CHIMNEY, ATTIC 204	4/14/92	2/15
M-003N-14	MAIN HOUSE	BED MORTAR, NORTH WALL, OFFICE 003	4/30/92	5/11
M-003E-17	MAIN HOUSE	BED MORTAR, CENTRAL CHIMNEY FOUNDATION, OFFICE 003	4/30/92	2/67
M-003S-18	MAIN HOUSE	BED MORTAR, SOUTH WALL, OFFICE 003	4/30/92	3/16
M-002S-20	MAIN HOUSE	BED MORTAR, SOUTH WALL, MECHANICAL ROOM 002	4/30/92	1/21
M-002S-23	MAIN HOUSE	BED MORTAR, SOUTH WALL, MECHANICAL ROOM 002	4/30/92	0/1
M-002N-25	MAIN HOUSE	BED MORTAR, NORTH WALL, MECHANICAL ROOM 002	4/30/92	1/10
M-002N-27	MAIN HOUSE	BED MORTAR, NORTH WALL, MECHANICAL ROOM 002	4/30/92	1/11
M-E- 39	MAIN HOUSE	BED MORTAR, EAST CHIMNEY STACK, EAST FACE	5/4/92	4/13
LIME\DIRTY SAND MORTAR				
M-003E-15	MAIN HOUSE	BED MORTAR, CHIMNEY FOUNDATION, OFFICE 003	4/30/92	3/13
M-W- 40	MAIN HOUSE	BED MORTAR, WEST CHIMNEY STACK, WEST FACE	5/4/92	1/7
LIME/SAND STONE BUILDING MORTAR				
M-SBN- 29	STONE BLDG	BED MORTAR, NORTH INTERIOR WALL	5/1/92	1/4
M-SBSE-30	STONE BLDG	BED MORTAR, SOUTH EXTERIOR WALL	5/1/92	1/2
M-SBSE-32	STONE BLDG	BED MORTAR BEHIND M-SBSE-31, SOUTH EXTERIOR WALL	5/1/92	1/4
M-SBSE-33	STONE BLDG	INNER WALL MORTAR BEHIND M-SBSE-32, S. EXT. WALL	5/1/92	1/5
LIME/SAND OUTBUILDING A MORTAR				
M-OBA- 34	OUT BLDG A	N. ROOM, S. WALL, 2'3" AF, 5'10" FROM E. WALL	5/1/92	1/3
M-OBA- 35	OUT BLDG A	S. ROOM, N. WALL, 1' AFF, 6'8" FROM W. WALL	3/2/92	1/3
M-OBA- 37	OUT BLDG A	S. RM., W. WALL @ COLLAPSED WYTHE, 1'10" FROM T/W	3/2/92	1/4

SCHEDULE OF ABBREVIATIONS

AF	ABOVE FLOOR	N.A.	NOT ANALYZED
CL.	CLOSET	OBA	OUTBUILDING A (ICE HOUSE)
E.	EAST	S.	SOUTH
EXT.	EXTERIOR	SALV	SALVAGED
L	LATH	SB	STONE BUILDING
LV RM	LIVING ROOM	T/W	TOP OF WALL
M	MORTAR	W.	WEST
N.	NORTH		

PLASTER

Eighteen plaster samples from the Main House and Stone Building wall and ceiling finishes in 1992. Most of these samples were analyzed for constituent materials and proportional mix by Architectural Conservator David Arbogast during May and June 1992. The purpose of the analysis was to; determine the extent of original plasters, and determine a compatible mix for repair work.

Main House

Ten plaster samples were analyzed from the Main House. In general plaster finishes on the east and west walls of the second floor hall (202) are believed to be the original finishes remaining in the house (for more specific information regarding plasters, see Room Finishes analysis, Division 2). All other plaster finishes were replaced with gypsum based plasters probably during the twentieth century, although some remnants of original plasters may not yet have been sampled from areas not yet investigated. Samples of hall 202 finishes and remains of original plaster found in wall and ceiling cavities confirm a 1:2 mix of lime/sand.

Gypsum/sand based plasters were found to contain two types of binders; dark animal hair and organic fibre. It is suspected that the animal hair plasters predated the fibre plasters given that fibre plasters were installed in rooms confirmed to have had finish replacement in 1940. Animal hair gypsum plasters were probably first installed in the house around 1915 during Albert Wenzlick renovation work.

Stone Building

One sample of a mortar parge coat was taken from the interior stone surface of the Stone Building for analysis. Although there is no physical evidence that interior surfaces were never finished in plaster or even paint, an area near the northeast corner exhibited what appears to be a parge coat of mortar. The sample is within the range of mix proportions for the historic mortars analyzed for the structure. The appearance of the sample also compares favorably with the mortars. It is unknown if the parge coat was intentionally or accidentally applied.

PLASTER SAMPLE ANALYSIS SCHEDULE BY GROUPING

MARK	BUILDING	DESCRIPTION/LOCATION	DATE	LIME/ SAND
LIME/SAND PLASTERS				
PL-101E-02	MAIN HOUSE	AT SPLIT LATH CEIL. & WALL CORNER, E. WALL, RM 101	2/27/92	1/2
PL-104N-09	MAIN HOUSE	DEBRIS BETWEEN VERTICAL LOGS, N. WALL, BEDROOM 104	2/27/92	1/2
PL-202E-14	MAIN HOUSE	KEY AT BACK SIDE, EAST WALL, STAIR HALL 202	2/27/92	1/2
GYPSUM PLASTERS WITH DARK HAIR				
PL-102E-04	MAIN HOUSE	KEY AT BACK SIDE, EAST WALL, ENTRY HALL 102	2/27/92	gypsum
PL-102N-05	MAIN HOUSE	KEY AT BACK SIDE NEXT TO POST, N. WALL, HALL 102	2/27/92	gypsum
PL-103C-07	MAIN HOUSE	CEILING AT LIGHT FIXTURE ELEC. BOX, DINING ROOM 103	2/27/92	gypsum
PL-106C-12	MAIN HOUSE	CEILING ABOVE WINDOW 106-W2, DRESSING ROOM 106	2/27/92	gypsum
PL-207C-15	MAIN HOUSE	CEILING AT EXHAUST FAN, BATHROOM 201	2/27/92	gypsum
GYPSUM PLASTERS WITH LIGHT FIBERS				
PL-104N-08	MAIN HOUSE	AT EXISTING HOLE, NORTH WALL, BEDROOM 104	2/27/92	gypsum
PL-109S-13	MAIN HOUSE	AT ELECTRICAL SWITCH BOX, SOUTH WALL, KITCHEN 109	2/27/92	gypsum
PARGE COAT OVER STONE				
PL-SBN- 17	STONE BLDG	SURFACE COATING, NORTH WALL	5/1/92	1/3

SCHEDULE OF ABBREVIATIONS

E.	EAST
EXT.	EXTERIOR
LV RM	LIVING ROOM
N.	NORTH
N.A.	NOT ANALYZED
PL	PLASTER
RM	ROOM
S.	SOUTH
SB	STONE BUILDING
W.	WEST

APPENDIX D - PAINT ANALYSIS

A comprehensive paint analysis was performed on painted surfaces of all historic structures in 1992 and 1993 by Washington University Technical Associates (WUTA). Conservator David Arbogast analyzed six additional paint samples in September 1993. The purpose of these analyses was to: comparatively date early building construction episodes in association with other information; determine the origin of windows, doors, and other millwork salvaged and moved to other locations during the twentieth century; determine historic colors schemes; and assist in the identification of 1940 renovation work. A total of six-hundred-two paint samples were removed from interior and exterior surfaces of the five historic structures and an assortment of salvaged millwork, and analyzed to accomplish these goals. The focus of the investigation was the Main House however. Paint chronology information on specific building elements or systems is included within Fabric Survey sections of each structure.

The WUTA paint analysis is very extensive and bulky, and consequently cannot be included within this appendix. Therefore the following are verbal characterizations and Munsell notations determined for individual historic building systems and spaces. The data was principally supplied by the WUTA and Arbogast analyses reports, and in some isolated cases through in-situ analysis by the author. In this color chronology summary, specific samples are listed for reference purposes for each color layer. It must be noted that the presented color summaries are distilled from the analyses of numerous samples, as there was no perfect sample taken from the buildings. Sunlight exposure and accumulated dirt tend to degrade or darken colors, and there may have been variations in paint mix proportions from surface to surface.

MAIN HOUSE (HS-1) EXTERIOR FINISHES

Exterior Siding and Trim

The paint analysis revealed a clear color chronology of siding and trim on the remaining historic portions of the house. It is believed that the Layer 1 cream color served as the finish coat all siding and trim until the 1850s or 1860s. This was followed by the single grey coat. It is possible that the two-tone green finish was applied in 1874 (see Division II, Materials Analysis). It was not until after 1914 that the house was regularly painted with several if not numerous layers of white paint. While the WUTA analysis detected on average five or six episodes of white paint application, Arbogast detected over one dozen white coat applications on some exterior samples.

Long House and West Wing Siding

Layer	**Verbal**	**Munsell**
1.	Cream	10YR 8/2
2.	Light Grey	N 7
3.	Medium Green	5GY 5/6
4.	Off White	
5.	Off White	
6.	Off White	
7.	Off White	
8.	Off White	

Notes

Layer 1 characterization was derived from samples PS2-378, P1S-422, and P1SW-425.

An average shade of grey was determined for Layer 2. Munsell notations ranged between N 6.25 and N 7.5 for samples PN-001, PN-003, PN-005, P2S-385, P2S-387, P1S-422, P1SW-426, P2N-465, P1N-511, PE-517, PWW-528, and PWW-529.

Layer 3 characterization was derived from in-situ siding situated west of kitchen closet Door 108A-D1. WUTA paint analysis sample notations are within the parameters of the indicated color.

Long House and West Wing Corner Board, Skirt Board, and Fascia Trim

Layer	Verbal	Munsell
1.	Cream	10YR 8/2
2.	Dark Brown	7.5YR 3/2
3.	Light Grey	N 7
4.	Dark Green	10GY 2/4
5.	Off White	
6.	Off White	
7.	Off White	
8.	Off White	
9.	Off White	

Notes

Much of the historic trim has been replaced, removed, or is deteriorated. Therefore few samples were available for analysis. However, the available samples yielded color chronologies complimentary with siding and porch colors. The dark brown in Layer 2 was detected by Arbogast in sample PS2-601. However, black was detected in Layer 3 which may have been the dark green found throughout the house. Arbogast also found that the second floor crown moulding had sixteen final white layers. Samples used for this analysis include P1S-533 and PS2-601.

Long House Cornice and Porch Crown Moulding

Layer	Verbal	Munsell
1.	Off White	5YR 8.5/1
2.	Dark Brown	7.5YR 3/2
3.	Black	N 1.5
4.	Light Grey	N 7.0
5.	White	5Y 9/1
6.	White	5Y 9/1
7.	White	5Y 9/1
8.	White	5Y 9/1
9.	Varnish	--
10-21.	White	

Notes

The most interesting color in this group is the presence of black in Layer 3. It is believed that black was applied in conjunction with the two-tone green exterior color scheme. In Figure 2.11 there is a definite contrast between the crown moulding and adjacent dark green fascia trim. Nowhere else on the exterior of the house has black been detected. The dark brown found on Layer 2 matches layers found on other exterior trim and millwork. Curiously no grey paint was detected immediately after the dark brown when it is believed that the house was completely painted light grey. The light grey in Layer 4 is believed to have been applied around 1915. There is the possibility that the black painted moulding preceded the green paint scheme. The sample used for this analysis was P-S2-601.

Front Porch

Most prominent front porch elements were finished in the same colors as the siding and trim with one exception. Layer 2 reveals that the second floor porch posts and railings were painted a medium brown or terra cotta color which complimented the cream color of the rest of the exterior of the house. The color chronology of the first floor posts is unknown as these have been totally replaced. Each of the porch ceilings were found to have been painted in similar colors and layer chronologies.

Front Porch, Second Floor Posts

Layer	**Verbal**	**Munsell**
1.	Cream	10YR 8/2
2.	Medium Brown	5YR 4/2
3.	Light Grey	N 6.5/36.2% R
4.	Medium Green	7.5GY 5/6
5.	Off White	
6.	Off White	
7.	Off White	
8.	Off White	
9.	Off White	
10.	Off White	

Notes

In situ examination of balusters indicate a color chronology similar to that of the posts. All Layers derived from samples P2S-389 and P2S-392.

Front Porch, Second Floor Top Railing

Layer	Verbal	Munsell
1.	Cream	10YR 8/2
2.	Medium Brown	5YR 4/2
3.	Light Grey	N 6.5/36.2% R
4.	Medium Green	2.5G 3/4
5.	Dark Green	10GY 2/1
6.	Off White	
7.	Off White	
8.	Off White	
9.	Off White	
10.	Off White	
11.	Off White	

Notes

The dark green (Layer 5) may have been applied soon after application of the medium green (Layer 4) because of aesthetic considerations. In situ examination of lower railing paint layers indicate that it had been painted only medium green. Analysis derived from sample P2S-391.

Front Porch, First Floor Ceiling

Layer	**Verbal**	**Munsell**
1.	Beige	7.5YR 7/4
2.	Light Grey	N 6/30.0% R
3.	Medium Green	7.5GY 5/6
4.	Off White	
5.	Off White	
6.	Off White	
7.	Off White	
8.	Off White	
9.	Medium Grey	
10.	Light Grey	

Notes

Layers derived from samples P2S-407 and PSC1-515.

Front Porch, Second Floor Ceiling

Layer	**Verbal**	**Munsell**
1.	Cream	10YR 8/2
2.	Light Grey	N 6.5/36.2% R
3.	Medium Green	7.5GY 6/6
4.	Cream	
5.	Off White	
6.	Off White	
7.	Off White	
8.	Off White	
9.	Off White	
10.	Off White	

Notes

Layers derived from samples PSC2-516 and P2S-583. The chromochronology is probably similar if not identical to the first floor porch ceiling.

Exterior Window Casing and Sash Surfaces, and Door Casings

The analysis showed that the windows were painted in colors complimentary to the nineteenth century exterior siding colors.

Layer	Verbal	Munsell
1.	Cream	10YR 8/2
2.	Light Grey	N 7/43.1% R
3.	Dark Green	10GY 2/2
3a.	Dark Green	2.5G 3/4
4.	Cream	
5.	Cream	
6.	Off White	
7.	Off White	
8.	Off White	
9.	Off White	

Notes

Nearly all historic windows exhibited the cream color indicated in Layer 1.

There was a range of greys found in Layer 2 from N6.25 to N7.75. But the bulk of the samples indicated a median of N7.

Sample evidence consistently showed Layer 3 as a dark green.

Layer 3a is a green Layer brighter than Layer 3 which was found on several historic window sash. What this signifies is not known although it appears that the windows continued to be painted green during Albert Wenzlick's period of ownership. Perhaps the original paint surfaces on some of the windows had to be touched up by Albert. Layer 3a samples include P103W1S-396, P206W1-456 and -458 P101W6-506, and P101W1-507 to -509.

The door casing sample used was P202D1S-372.

Exterior Window Shutters

Physical evidence indicates that none of the existing shutters are from the Main House, although some may have been salvaged from other nineteenth century structures in the St. Louis area. Since no historic Main House shutters are extant, no accurate account of their paint colors exists at this writing. However, a single hand-wrought hinge pintle found on the exterior casing of Window 207-W1 is believed to have been installed at the time the Long House was constructed in 1818. It is believed that the shutters from this window were removed by 1840 when a gable roof was added to the Hunt Addition which interfered with the operation of the window and shutters. Analysis of the heavy paint coating on that hinge reveals what is believed to be the early colors of the shutters, assuming that paint was brushed over from the shutter to the hinge.

Layer	**Verbal**	**Munsell**
1.	Black	5Y 3/1
2.	Dark Brown	5YR 2/4
3.	Light Grey	5Y 8/1
4.	Grey	5Y 6/1
5.	Light Green	10GY 8/4
6.	Black	N 1.5
7.	Light Grey	N 7.0
8-26.	White	

Notes

Layer 1 may represent the initial hinge coating. The presence of dark brown in Layer 2 differs substantially when compared to the chromochronologies found on the Long House window casing and sash. It is assumed that the early shutters were painted dark brown as only cream and no dark brown was found on any exterior window casing. Since medium brown was found as a second layer on front doors and some porch components, and cream as an initial siding coat, dark brown would certainly be complimentary in the overall scheme of the house. All hinge colors after Layer 3 probably reflect paint applied to the surrounding window casing as it is thought that the Main House was not painted grey until after 1860. The black found in Layer 6 may actually have been the dark green found throughout the house. Sample PN-597 prepared by Arbogast, was used for this analysis.

Exterior Surfaces of Doors 102-D1 and 202-D1

The analysis showed that the color chronologies for these two south-facade exterior doors are very similar to what was found on the front porch elements. Two samples indicate that a lighter brown, or terra cotta, was apparently used on the front door in the second layer. It is possible that the differing color was selected to highlight the front door.

Exterior Surface of First Floor Porch Door 102-D1

Layer	**Verbal**	**Munsell**
1.	Cream	10YR 8/2
2.	Terra Cotta (102-D1)	5YR 5/6
3.	Light Grey	N 6.5/36.2% R
4.	Dark Green	7.5GY 2/4
5.	Off White	
6.	Off White	
7.	Off White	
8.	Off White	
9.	Off White	
10.	Off White	

Notes

Chromochronology for Door 102-D1 derived from samples P102D1S-402 and -403.

Exterior Surface of Second Floor Porch Door 202-D1

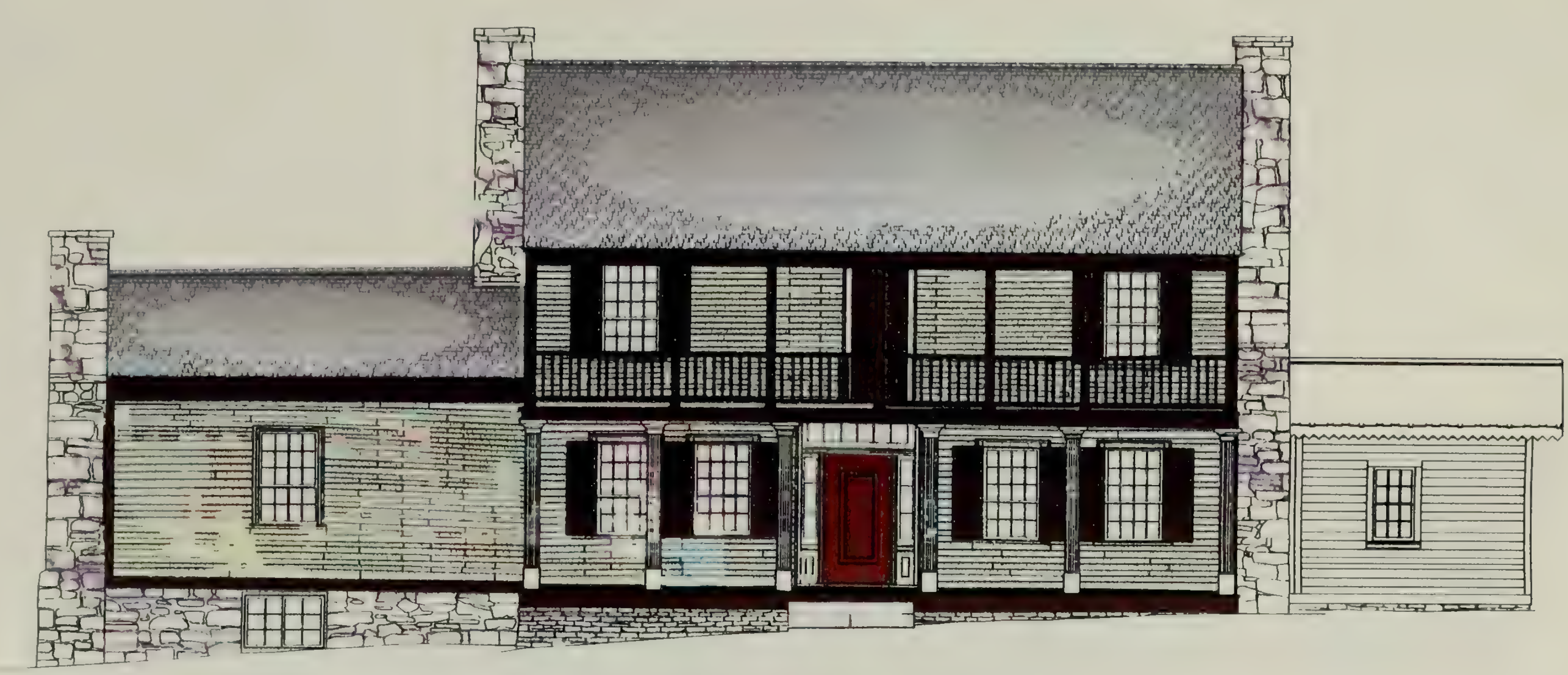
Layer	**Verbal**	**Munsell**
1.	Cream	10YR 8/2
2.	Light Grey	N 7.25/46.8% R
3.	Medium Brown	5YR 4/2
4.	Dark Green	10GY 2/4
5.	Off White	
6.	Off White	
7.	Off White	
8.	Off White	
9.	Off White	
10.	Off White	

Notes

The sample analysis for this door differs in comparison with front Door 102-D1 in that Layers 2 and 3 are reversed (sample P102D12-373). The reason for the inconsistency is unknown. Sample P202D1S-374 for one exterior panel exhibited intermixed multiple Layers of the above colors indicating that successive applications of paint may have infiltrated flaking or cracked Layers. Chromochronology for Door 202-D1 derived from samples P202D1S-373 and -374.

EXTERIOR CHROMOCHRONOLOGY PLATES

The following color plates illustrate the chormochronology at the south elevation of the Main House, based upon knowledge derived from analyzed paint samples. Note that illustration surfaces with no paint indicates that the color is unknown due to insufficient information. The presented illustration colors are representative only, but have been matched as close as possible to Munsell color chips. If future painting requires a color match, actual Munsell chips should be used rather than those shown on the illustrations.

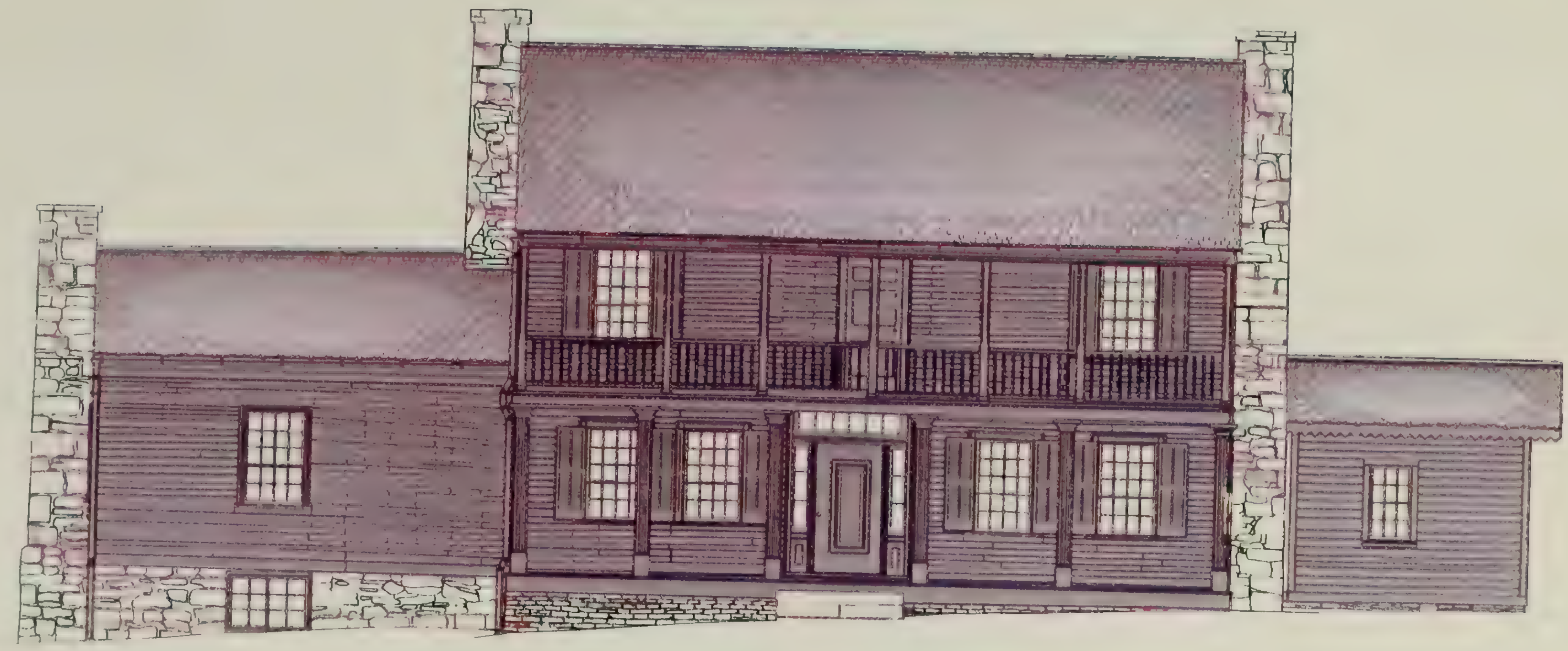


MAIN HOUSE PAINT CHRONOLOGY

PRIOR TO CIRCA 1860

MUNSELL COLOR KEY

☐	10YR 8/2
🟫	5YR 4/2
🟥	5YR 5/6
☐	UNKNOWN

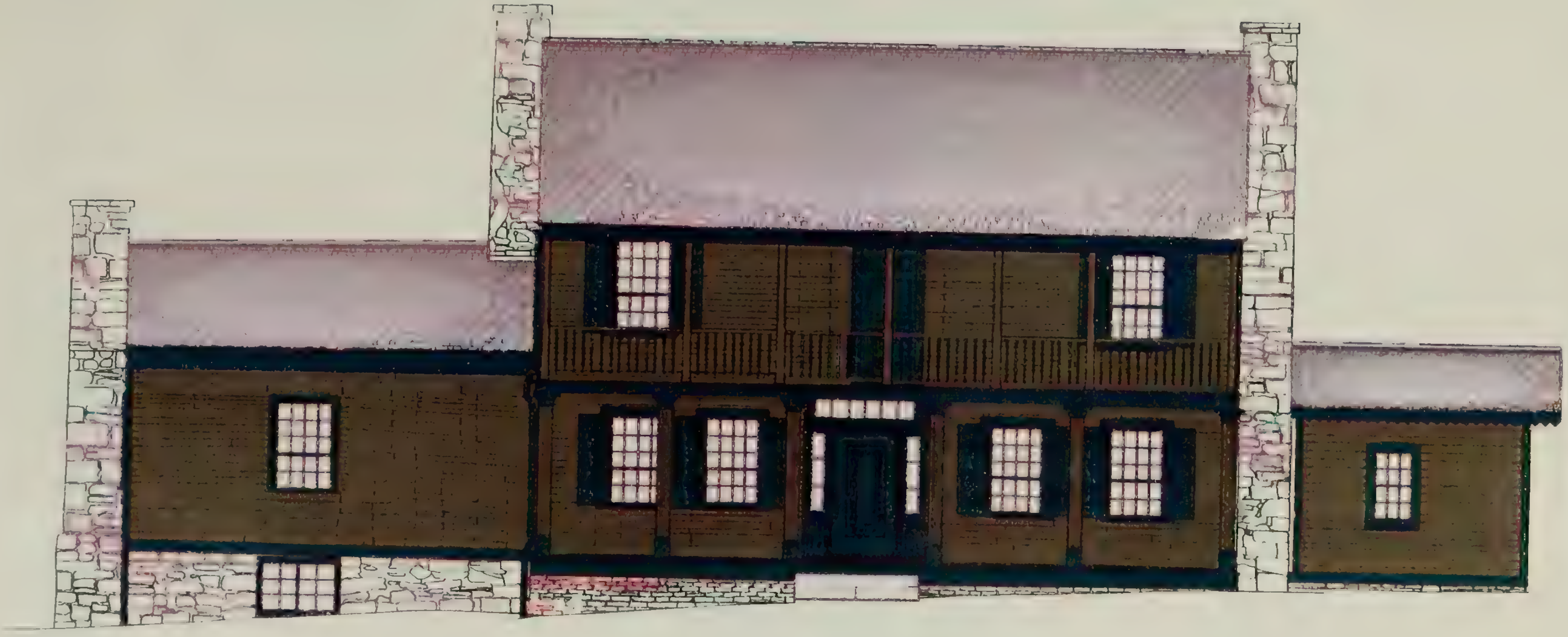


MAIN HOUSE PAINT CHRONOLOGY

CIRCA 1860-1874

MUNSELL COLOR KEY

▨ N 7/42.1% R



MAIN HOUSE PAINT CHRONOLOGY
1874-1915

MUNSELL COLOR KEY

🟫 5GY 5/6

⬛ 7.5GY 2/4

MAIN HOUSE (HS-1) INTERIOR FINISHES

The interior finish color schemes appear to mirror colors found on the exterior including beiges, browns, greys, dark green, followed by several layers of twentieth century. There is a difference between the first and second floor finishes however. The dark green color found on nearly all historic exterior and interior first floor trim and millwork is virtually missing from the second floor millwork. Absence of dark green complicates attempts to date the application of any paint layer relative to the nineteenth century. Since all historic plaster finishes have been replaced in the house, no analysis is rendered for wall and ceiling finishes. Moreover, it is strongly believed that the walls were historically covered with paper rather than painted. The following analysis addresses paint schemes for individual historic rooms based upon the findings of the many samples taken from the room millwork. Additionally, chromochronologies are also presented for historic millwork types where it is thought that enough clear evidence is available to do so.

Room 101 - Living Room

The color chronology in this space is difficult to determine as extensive twentieth century renovation work has moved, removed, and modified much of the millwork. In addition work performed by 1840 created a smaller space through the installation of the extant west partition. Only three sections of baseboards appear to be historic although the colors chronologies vary greatly indicating that the baseboards may have been salvaged from another room. Therefore, no analysis has been attempted for the baseboards of this room. It is suspected that the corner post casings were covered with paper finishes for a time and therefore there are gaps in the paint record. While the remaining chair rails are historic the paint record is muddled. The second chimney piece to be placed in this room around 1840 was replaced and destroyed in the 1940s. However, the original chimney piece is believed to have been moved to Room 104 during circa 1840 renovation work. The most reliable samples in this room were removed from two historic window casings.

Window Casings and Sash - Room 101

Layer	Verbal	Munsell
1.	Beige	10YR 7/4
2.	Cream	10YR 9/2
3.	Cream	10YR 8/2
4.	Medium Grey	10YR 5/1
5.	Dark Green	2.5GY 3/4
6.	Cream	
7.	Cream	
8.	Cream	
9.	Off White	

Notes

Since Window 101-W3 is believed to have been in place since construction of the Long House, and Window 101-W2 by 1840, the developed chromochronology was based upon samples from these two windows. Samples used include P101S-175 to -177, and -180 to -182.

Post Casings - Room 101

Layer	Verbal	Munsell
1.	Beige	5Y 9/1
2.	Beige/ocher	10YR 8/6
3.	Beige/cream	10YR 8/2
4.	Beige	7.5YR 9/2
5.	Cream	2.5Y 9/2
6.	Beige/cream	10YR 8/2 or 10YR 9/1
7.	Cream	10YR 9/1
8.	Paper	
9.	Off White	N 9.25
10.	Cream	
11.	Off White	

Notes

The preponderance of cream and beige on the two post casings when compared to the use of bolder shades on other room millwork, and the presence of paper in one sample (P101E-162), suggests that the post casings were covered with wall paper for a time. However, it is still possible that the casings retained their muted hues while the rest of the room continued to be painted with complimentary colors. It is difficult to judge when the wall papering occurred or even how these layers fit into the color scheme of the room. The reference samples used for this chromochronology include P101E-161, -162, -174, and -572.

Chair Rails - Room 101

Layer	Verbal	Munsell
1.	Beige	10YR 7/4
2.	Cream	5YR 8/2
3.	Cream	10YR 8/2
4.	Medium Grey	5Y 5/1
5.	Dark Green	5GY 3/2
6.	Cream	
7.	Cream	
8.	Cream	
9.	Off White	

Notes

Many of the chair rail samples presented only portions of the chromochronology; there did not appear to be a "pure" sample in the lot. As a result the chromochronology was derived from a variety of samples using the dark green of Layer 5 as a reference point. It was found that the chair rail chronology is very close to that of the windows. Some isolated dark renditions of sample colors may have been affected by dirt and grime. Reference samples used for this chronology include P101E-165 and -172, P101S-178, -183, and -187, and P101N-194, -196, -197, and -199.

Baseboards - Room 101

Layer	Verbal	Munsell
1.	CANNOT BE DETERMINED	

Notes

Only three sections of baseboard in room 101 have historic integrity. The samples from each of these are too varied to develop a chromochronology. It is possible that the baseboards may have been salvaged from elsewhere in the house. All historic baseboards are at the east wall and represented by samples P101E-166 and -167, and -488.

Room 102 - Stairhall

This room has been extensively modified during the eighteenth and nineteenth centuries. The circa 1840 addition of the east wall, installation of the Greek Revival front door, removal of the west wall, and remodeling of the stair, combined with the extensive 1940 renovation work create difficulties in determining a clear chromochronology for this space. Nearly all millwork exhibited an initial cream or beige coat. The following two to three paint layers varied considerably in hue, shade, and chronology for each millwork sample. However, each millwork piece displayed a medium grey layer followed by the dark green, and subsequent cream coats applied during the twentieth century.

The newel post, balusters, and treads for Stair S-1 were apparently stained and/or varnished very early. It is believed that he stair was renovated from a boxed to the existing open style around 1840 and therefore the chromochronology may begin at that date for these millwork pieces. However, the glaze is followed by the medium grey seen throughout the remainder of Room 102 and the rest of the house as well.

Baseboards - Room 102

Layer	Verbal	Munsell
1.	Beige	10YR 8/2
2.	Medium Grey	5Y 7/1
3.	Medium Grey/brown	5YR 4/1
4.	Medium Grey	5Y 5/1
5.	Dark Green	5GY 3/2
6.	Cream	
7.	Cream	
8.	Cream	
9.	Off White	

Notes

Some of the representative samples were deteriorated so adjustments had to be made for missing layers in some samples using the dark green Layer as a reference point. Layers 2 through 4 exhibited a range of shades possibly due to soiled or faded samples. Representative samples for this chromochronology are P102E-06, -08, and -09, P102S-15, P102W-25, -34, and -35.

Post Casing and Corner Bead - Room 102

Layer	**Verbal**	**Munsell**
1.	Cream	10YR 9/2
2.	Brown/grey	2.5Y 4/2
3.	Medium Grey/brown	5YR 4/1
4.	Dark Green	5GY 3/2
5.	Cream	
6.	Cream	
7.	Off White	

Notes

Apparently these vertical pieces of millwork did not receive as many coats of paint as did other millwork in room 102. However, the chromochronology appears to fall in favorably with that of the baseboard color schemes. The chromochronology was derived using the dark green Layer as a reference point. Reference samples include P102N-36, -566, -567, and P102W-24.

Door and Window Casings - Room 102

Layer	**Verbal**	**Munsell**
1.	Cream	10YR 9/2
2.	Cream	10YR 9/1
3.	Medium Grey	5Y 5/1
4.	Dark Green	5GY 3/2
5.	Cream	
6.	Cream	
7.	Cream	
8.	Off White	

Notes

Very similar to other millwork in this room except the casings were painted twice with cream before the application of one Layer of grey. Representative samples include P102S-11, and -13, P102N-38, P102E-07, P102W-18, -21, and -31.

Front Door 102-D1, and Back Door 102-D2 interior Surfaces - Room 102

Layer	Verbal	Munsell
1.	Cream	10YR 8/2
2.	Medium Brown	7.5YR 5/6
3.	Medium Grey	5Y 5/1
4.	Dark Green	5GY 4/2
5.	Cream	
6.	Cream	
7.	Cream	
8.	Off White	

Notes

The interior of front Door 102-D1 was painted very similar to its exterior. The paint analysis reinforces physical evidence that the middle rail was added sometime after installation of the door. The rail's chromochronology begins at Layer 3 (see sample P102S-568). Representative samples include P102S-12, -14, and -568.

Door 102-D2 appears to have a similar chromochronology to 102-D1 but a panel sample had many more intermixed paint coats than the rail sample. Another sample may have to be taken to determine the exact chronology of this door. Samples analyzed include P102N-39 and -40.

Basement Door 102-D3 - Room 102

Layer	Verbal	Munsell
1.	Beige	7.5YR 8/4
2.	Beige	10YR 7/4
3.	Light Brown	5YR 6/4
4.	Medium Grey	5Y 5/1
5.	Dark Green	5GY 3/2
6.	Cream	
7.	Cream	
8.	Cream	
9.	Off White	

Notes

A chromochronology in line with other room millwork except for the apparent use of two beige coats followed by a light brown rather than a medium brown found in other doors. Referenced samples include P102W-22 and -23.

First Floor Stair S-1, Stringer - Room 102

Layer	**Verbal**	**Munsell**
1.	Cream	10YR 8/2
2.	Medium Grey	5Y 5/1
3.	Dark Green	5GY 3/2
4.	Cream	
5.	Cream	
6.	Cream	
7.	Off White	

Notes

The absence of browns as recorded on other millwork in room 102 reinforces physical evidence that stair had been modified during the mid-nineteenth century. The sample used for this chromochronology is P102W-26.

First Floor Stair S-1, Newel Post, Baluster, and Tread - Room 102

Layer	**Verbal**	**Munsell**
1.	Dark Beige	
2.	Glaze	
3.	Medium Grey	5YR 5/1
4.	Dark Green	5GY 3/2
5.	Cream	
6.	Cream	
7.	Off White	

Notes

Traces of dark beige on a baluster sample suggests that the glaze indicated in Layer 2 may have covered a base coat. However, these stair elements may have initially been varnished or shellacked and the beige may represent a stain or contamination. It appears that the stair continued to be unpainted until room 102 was painted grey. Samples analyzed include P102W-27 though -29.

Room 103 - Dining Room

As with Room 102, paint samples from millwork in this room displayed a confusing array of early nineteenth century colors. No consistent pattern could be found between the initial beige coat and the dark green color layer. Light to medium browns and greys, beiges, and yellow ochers appear erratically throughout the samples. Unfortunately, no clear general color chronology can be determined for this room. However, baseboard paint samples form what is believed to be the most consistent chromochronology for the room. Perhaps past renovation work and paint deterioration have rendered the layers confusing.

Baseboards - Room 103

Layer	**Verbal**	**Munsell**
1.	Beige	10YR 8/2
2.	Medium Grey	10RP 4/1
3.	Light Brown/Dark Beige	7.5YR 4/2
4.	Dark Green	5GY 3/2
5.	Yellow Ocher	
6.	Cream	
7.	Cream	
8.	Cream	
9	Off White	

Notes

The baseboards provided what is believed to be the best indicator of general color chronology for this room. It is believed that few of the baseboards have been removed and salvaged during renovation work, or modified in some way to reflect changes in door openings. The interesting aspect of this chromochronology is that a brown color precedes the dark green layer when the general attitude of other color chronologies in the house is that grey precedes the green. Reference samples include P103N-48 and -53, P103E-62 and -66, P103S-73 and -78, and P103W-83 and -86.

Doors and Casings - Room 103

Layer	Verbal	Munsell
1.	Beige	10YR 8/4
2.	Med Brown/Dark Beige	2.5Y 6/4
3.	Beige	10YR 7/4
4.	Medium Grey	5YR 5/1
5.	Dark Green	5GY 3/2
6.	Cream	
7.	Cream	
8.	Cream	
9.	Off White	

Notes

Door and casing samples exhibited a wide range of beiges and browns which may reflect the fact that most of the doors have had extensive renovation work, have been moved in from elsewhere, or added to the house during various times in the nineteenth century. This general chromochronology is based heavily upon the casing of Door 103-D2 which is believed to have been in place since construction of the Long House. Samples consulted for this chromochronology include P103E-57 and -64, P103W-85, and P103E-58 and -59.

Chimney Piece - Room 103

Layer	Verbal	Munsell
1.	Beige	10YR 9/2
2.	Black	N 0.5
3.	Medium Grey	5YR 6/1
4.	Light Grey	10YR 6/1
5.	Dark Green	5GY 3/2
6.	Yellow Ocher	
7.	Cream	
8.	Cream	
9.	Cream	
10.	Off White	

Notes

This chimney piece is believed to have been in this room since construction of the Long House. The chromochronology includes a black but no browns. In comparison to other historic chimney pieces throughout the Main House, the black layer on this chimney piece seems to have been applied much earlier. Samples referred to include P103W-88, -89, and -93.

Window Sash and Casings - Room 103

Layer	**Verbal**	**Munsell**
1.	Beige	10YR 9/1
2.	Yellow Ocher	7.5YR 7/8
3.	Cream	2.5Y 8/2
4.	Yellow Ocher	7.5YR 7/8
5.	Dark Green	5GY 3/2
6.	Yellow Ocher	
7.	Cream	
8.	Cream	
9.	Cream	
10.	Off White	

Notes

Except for the initial coat of beige and the dark green layer found throughout the house, the paint sample chromochronologies from the two windows of this room are inconsistent with respect to the intervening colors and their order. Out of six samples only two grey Layers were detected and even then there was no consistency in their relationship with other layers. Perhaps the window finishes had deteriorated or been poorly maintained for a time. The presence of yellow ocher Layers preceding dark green is unique with respect to the rest of the house. Perhaps a beige deteriorated in sunlight or the window components came from elsewhere in the house. Samples used for the analysis include P103S-68, -69 -70, -75, -76, and -77.

Chair Rails - Room 103

Layer	**Verbal**	**Munsell**
1.	Beige	10YR 8/2
2.	Light Grey	5YR 6/1
3.	Medium Grey	5Y 5/1
4.	Dark Green	5GY 3/2
5.	Yellow Ocher	
6.	Cream	
7.	Cream	
8.	Off White	

Notes

This chromochronology is typical for what has been found for interior finishes except for the absence of dark beige or brown layers which appear in other elements of this room. Reference samples include P103N-47, -52 and -54, P103E-60 and -61, P103S-72 and -79, and P103W-82.

Room 104 - Bedroom

Baseboards, doors, and door casings show a fairly consistent colors and layer chronology of beige, brown, grey, and dark green. The windows differed slightly in that only one sample of eight indicated the brown second layer detected in the other millwork. Perhaps the window finishes degraded over time due to sunlight exposure or the casings were replaced early during the nineteenth century. The brown layer is also absent in the chimney piece samples, possibly because this chimney piece was moved from Room 101 during circa 1840 renovation work. Except for the chimney piece, it is believed that Room 104 millwork was painted in the following:

Layer	**Verbal**	**Munsell**
1.	Beige	10YR 8/2
2.	Light Brown	10YR 3/6
3.	Light Grey	5Y 5/1
4.	Dark Green	5GY 3/2
5.	Pale Blue/Light Grey	10B 6/2
6.	Yellow Ocher	
7.	Cream	
8.	Cream	
9.	Cream	
10.	Off White	

Baseboards - Room 104

Layer	**Verbal**	**Munsell**
1.	Beige	10YR 8/2
2.	Light Brown	5YR 4/2
3.	Light Grey	5Y 6/1
4.	Dark Green	5GY 3/2
5.	Dark Green	5GY 3/2
6.	Pale Blue/Light Grey	10B 6/1
7.	Yellow Ocher	
8.	Cream	
9.	Cream	
10.	Cream	
11.	Off White	

Notes

All baseboards were found to be very consistent in color chronology. Samples consulted include P104N-105, -573, and -574; P104E-110 and -115; and P104S-117, -123, and -126.

Doors and Door Casings - Room 104

Layer	Verbal	Munsell
1.	Beige	10YR 8/2
2.	Light Brown	10YR 3/6
3.	Light Grey	5Y 5/1
4.	Dark Green	5GY 3/2
5.	Pale Blue/Light Grey	10B 6/2
6.	Yellow Ocher	
7.	Cream	
8.	Cream	
9.	Cream	
10.	Off White	

Notes

The doors and casings compare favorably with the baseboards of Room 104. Samples for layer 2 had a wide range of light to medium browns and brown/greys but fell within the light brown range found on all baseboards. Samples consulted for this analysis include P104N-102 and -103; P104E-106 to -108, and -111 to 113.

Windows and Window Casings - Room 104

Layer	Verbal	Munsell
1.	Beige	10YR 8/2
2.	Medium Grey	5YR 5/1
3.	Dark Green	5GY 3/2
4.	Light Grey	5Y 6/1
5.	Pale Blue/Light Grey	10B 6/2
6.	Cream	10YR 9/1
7.	Pale Blue/ Light Grey	10B 6/2
8.	Yellow Ocher	
9.	Cream	
10.	Cream	
11.	Off White	

Notes

Window color Layers slightly differ relative to that found on the baseboards and doors of Room 104. The principal difference is the absence of a light brown second layer found elsewhere. Only one layer of light brown was detected on the bottom sash of Window 104-W2 (sample P104W-130). The medium grey found on Layer 2 is darker than found on the doors and baseboards. The reason for these discrepancies may be that the West Wing windows are subjected to more sunlight than the other millwork in the room which may have deteriorated or faded paint layers. Samples consulted for the windows include P104W1-121 and -127; P104S-118 to -120; and P104W-128 to -130.

Chimney Piece - Room 104

Layer	Verbal	Munsell
1.	Beige	10YR 8/4
2.	Light Grey	5Y 6/1
3.	Black	N 0.75
4.	Light Grey	5YR 5/1
5.	Dark Green	5GY 4/2
6.	Drab	
7.	Off White	
8.	Pale Blue/Light Grey	
9.	Yellow Ocher	
10.	Cream	
11.	Cream	
12.	Cream	
13.	Off White	

Notes

This chimney piece is believed to have been salvaged from Room 101 when the West Wing was added to the Long House. The beige seen in Layer 1 is consistent with first layers on other millwork throughout Room 104. But there is a complete absence of a brown to compliment the light brown found on the second Layer in other Room 104 millwork. Either the chimney piece continued to retain the beige coat when other Room 104 millwork was painted in light brown. Or the absence of a brown Layer indicates that the chimney piece was salvaged from Room 101 and installed in Room 104 at a time when the room was painted in a coat of light or medium grey. The black layer is consistent with a similar layer found on the Room 103 chimney piece. The principal samples used for this analysis were removed from the right leg and frieze and include samples P104W-131 and -132. Two other samples removed from near the edge of the firebox do not have consistent layers due to the deteriorative effects of heat and trim that had been nailed to the edge which concealed the surfaces from periodic paint application. Those samples include P104W-133 and -134.

Room 104A - Hall

This small space served as an important circulation node during the early to middle nineteenth century. Paint samples exhibit inconsistent or broken paint chronologies for each of the three doors that open into the small space. No other millwork in the space is historic. The single sample removed from Door 103-D3 had a complete absence of Layers 2 through 5 seen in Door 104-D1 above. Door 108A-D1 had only four layers with a unique color chronology in comparison to the other two doors. The reason for this is unclear, perhaps the door leaf came from elsewhere.

Door 104-D1 - Room 104A

Layer	Verbal	Munsell
1.	Beige	10YR 8/2
2.	Light Brown	10YR 7/4
3.	Medium Brown	10YR 3/4
4.	Light Grey	N 7.75
5.	Light Grey	5YR 5/1
6.	Dark Green	5GY 3/2
7.	Medium Grey	
8.	Pale Blue	
9.	Cream	
10.	Cream	
11.	Cream	
12.	Off White	

Notes

Samples used for Door 104-D1 include P104W-98 to -100. Sample P104E-96 was taken from the head casing of Door 103-D3. The Door 108A-D1 sample, P104AN-600 was analyzed by Arbogast.

Door 108A-D1 - Room 104A

Layer	Verbal	Munsell
1.	Grey Varnish	
2.	Tan	2.5Y 7/4
3.	White	5Y 9/1
4.	Tan	2.5Y 7/4

Notes

Sample P104AN-600 was taken from the door leaf and analyzed by Arbogast September 1993. The relatively few layers and absence of the dark green in comparison with other first floor millwork indicates that the door may have been sealed by plaster finishes as early as 1874 when it is thought that the two tone green paint was applied.

Room 106 (1940 HABS Room 4) - Dressing Room

Although the historic materials of this room were almost completely demolished in 1940, it is believed that enough in-situ and salvaged millwork has been found to determine a chromochronology. Prior to 1940 the room was measured by HABS and delineated as Room 4. It is believed that HABS Room 4 served as a kitchen from the time of its construction around 1874, until its demolition. The most important key in determining the color chronology of the old room was the discovery that the north casing and jamb of Door 106-D1 contained a distinct turquoise color layer found nowhere else in the house or other structures on the property. It is believed that this door opening has been in place since the early nineteenth century. During physical investigation work on other structures, millwork containing the turquoise layer was found in the Chicken House loft, Ice House cellar, and nailed to the West Wing roof of the Main House. Also found were a pair of window sash salvaged for use in second floor bedroom Window 201-W2, and a door casing on Main House Door 103-D4, all installed in 1940. Door D-3, installed on the Stone Building around 1950, is believed to have been salvaged from Room 4. From these pieces of millwork the character of HABS Room 4 was also determined. The following is what is believed to have been the chromochronology for the demolished HABS Room 4.

Layer	Verbal	Munsell
1.	Beige	10YR 9/1
2.	Drab/Grey	10YR 5/2
3.	Dark Green	5GY 3/2
4.	Turquoise	10BG 5/6
5.	Pale Olive	5Y 6/2
6.	Yellow Ocher	7.5YR 7/6

Notes

On several pieces the turquoise finish was found to be the initial color layer (crown moulding sample P-ART20-562 and baseboard shoe moulding sample P-ART39-563). It is possible that some cosmetic modifications were made to the kitchen at the time the room was painted turquoise. The date turquoise was applied is speculated to have been at the time Albert Wenzlick renovated the house around 1915 since that coat of paint post-dates application of the dark green on other salvaged millwork. The sash now in Window 201-W2 (P201S-218 and -219), Door 103-D4 casing (P103N-49), and salvaged window casing (P-ART9-560) were found to have initial layers of beige, grey and some dark green prior to turquoise. These pieces were probably installed at the time HABS Room 4 was constructed. No beige was found on Stone Building Door D-3, but its chromochronology matches that of the above table from Layer 2 on (P(SB)N-593 and -594). In addition to the above mentioned samples, P-ART12-556 was also used in this analysis. Other millwork items found on the site that clearly have a turquoise finish, but were not color analyzed, include building artifacts ART-17, -18, -43, -93, and -95.

1940 HABS Room 6, Hunt Addition

This room was constructed between 1818 and 1820, and completely demolished in 1940. There exists one piece of interior millwork, a length of chair rail, which is strongly believed to have come from this room. The chair rail was discovered in the Chicken House loft in 1992. Its profile compares favorably to images of a chair rail seen in the 1940 HABS photographs taken during demolition of the Hunt Addition (Figure 2.28). In addition, nails remaining in one end of the chair rail match nail holes seen in framing at the northeast corner of the Hunt Addition in Figure 2.30. It is believed that the chair rail fit along the east wall between the northeast corner and the chimney piece.

A found chimney piece mantel shelf and a panel door now on the Ice House may have originated from the Hunt Addition fireplace and doorway respectively, but this has yet to be confirmed by other documentary means. Paint analysis of the shelf (P-ART30-551) and door (P-N-549) indicates an initial finish of a very dark brown or black which compares favorably with a black coat found in Layer 3 of the chair rail. While the physical evidence is scant given that only one, and perhaps three pieces of millwork remain from the interior, the results are non-the-less presented here as a guide to future work should the Hunt Addition be restored. Paint sample P-ART3-595 for the chair rail in addition to the above mentioned sample numbers were used for this analysis.

Layer	Verbal	Munsell
1.	Medium Grey	5B 4/1
2.	Cream	10YR 8/1
3.	Black	N 1
4.	Dark Green	10GY 2/4
5.	Cream	10YR 8/1
6.	Cream	7.5YR 8/4

Room 201 - Bedroom

Millwork samples in this space were found to have inconsistent color chronologies. Only several baseboards, one door panel, and the chimney piece indicated similar chromochronologies. The single post casing had few finish layers indicating that paint had been stripped, or the casing had been covered with wall paper for a time similar to the first floor post casings. No brown layers were detected on the only historic window in the room, 201-W1. Although Window 201-W2 was installed in 1940, the sash came from elsewhere in the house (see HABS Room 4 paint analysis). Except for the chimney piece and possibly Window 201-W1, the following summarizes what is believed to be the chromochronology for the room.

Layer	**Verbal**	**Munsell**
1.	Beige	10YR 8/2
2.	Rosy Brown	10RP 5/2
	Light Brown	7.5YR 5/4
3.	Medium Grey	5Y 5/1
4.	Olive Drab	5Y 6/2
5.	Cream	10YR 9/1
6.	Cream	10YR 9/2
7.	Cream	10YR 8/2
8.	Off White	N 9

Baseboards - Room 201

Layer	Verbal	Munsell
1.	Beige	10YR 8/2
2.	Rosy Brown	10RP 5/2
3.	Medium Grey	5Y 5/1
4.	Varnish	
5.	Dark Green	5G 3/2
	Olive Drab	5Y 6/2
6.	Cream	10YR 9/2
7.	Cream	10YR 8/2
8.	Off White	N 9

Notes

All baseboards exhibit a fairly consistent color chronology except for Layer 5 where two baseboards have a dark green layer. All others baseboards had an Olive Drab color in Layer 5. It is possible that the two baseboards with the dark green band were salvaged from elsewhere in the house or dark green was not detected in the other baseboards due to paint deterioration or surface preparation which may have loosened paint layers. There was a wide range of hues under the Layer 2 verbal characterization of "Rosy Brown." Some paint in Layer 2 was more purple than brown but was still in the range of browns found in other Room 201 millwork. It is surprising that the north wall baseboards had color layers consistent with other Room 201 baseboards as it is believed that the north wall was installed in 1914 and remodeled in 1940. It is possible that the north wall baseboards were salvaged from Bathrooms 206 and 207 when these rooms were created from a single large bathroom in 1940. The varnish layer is consistently found in nearly all samples but found nowhere else in Room 201. Sample results consulted for the baseboards include P201N-204 and -494; P201E-495 and -211; P201S-216, -220, and -575; and P201W-227.

Door 201-D1 - Room 201

Layer	Verbal	Munsell
1.	Beige	10YR 8/2
2.	Light Brown	7.5YR 5/4
3.	Olive Drab	5Y 5/2
4.	Medium Grey	5Y 5/1
5.	Cream	
6.	Cream	
7.	Cream	
8.	Off White	

Notes

Of three doors in Room 201, only Door 201-D1 is historic. Of three paint samples removed from the door and casing only one from a door panel, P201W-226, exhibits layers consistent with that found on baseboard and chimney piece millwork in Room 201. Samples removed from the lower door rail (P201W-225) and the casing from near the floor (P201W-224) had few paint layers indicating that paint scraping or deterioration of the finishes had taken place.

Chimney Piece - Room 201

Layer	Verbal	Munsell
1.	Beige	10YR 9/2
2.	Rosy Brown	5YR 4/2
3.	Brown Grey	5YR 5/1
4.	Black	N 0.75
5.	Olive Drab	5Y 6/2
6.	Cream	
7.	Cream	
8.	Cream	
9.	Off White	
10.		

Notes

The chimney piece color layers are consistent with those found on the baseboards and historic door of Room 201, except for the black found in Layer 4. The black coat is consistent with the other historic chimney pieces in the house; the layer probably complimented grey finish layers found on other millwork in this room. Sample results consulted for this analysis include P201E-209, -210, and -496.

Room 202 - Stairhall

Samples from millwork types in this room show inconsistency in nineteenth century color chronologies. Some of the baseboards may have been moved or salvaged from elsewhere in the house during twentieth century renovation work. While many of the baseboards exhibit similar colors, the layers are not consistently ordered. One baseboard from the west wall may have been salvaged from elsewhere as it contained a dark green paint layer absent from the remainder of the second floor millwork. The only historic window has had extensive renovation work and therefore paint analysis has shown only partial chromochronologies. All three samples taken from Door 202-D1, which opens onto the second floor porch, are consistent in colors and layers but these differed somewhat in comparison to the baseboards and two other historic doors. It is unknown if the porch door was painted differently from the rest of the millwork in the room or if the door was moved in from somewhere else. Varnish, detected on Layer 2 of Door 202-D1, was not found on any window or baseboard millwork and on only one other historic door sample. Because of inconsistencies in color chronologies for specific millwork types, suggestion of an overall color scheme for this room is not possible.

Baseboards - Room 202

Layer	Verbal	Munsell
1.	Beige	10YR 7/2
2.	Medium Grey	5Y 7/1
3.	Rosy Brown	10RP 5/2
4.	Cream	
5.	Cream	
6.	Cream	
7.	Off White	

Notes

Analysis results of the baseboard layering chronologies are inconsistent. However, medium grey and rosy brown to brown colors were consistently detected. Samples used for this analysis include P202N-290; P202E-294 and -579; P202S-302; and P202W-303 and -307.

Doors 201-D1 and 203-D1 - Room 202

Layer	**Verbal**	**Munsell**
1.	Beige	10YR 8/2
2.	Medium Grey	N 6
3.	Drab/Olive	5Y 4/2
	Rosy Brown	10RP 5/2
4.	Cream	
5.	Cream	
6.	Cream	
7.	Off White	

Notes

Door 201-D1 had few paint layers with no drab/olive or rosy brown found on Door 203-D1. Samples consulted include P202E-295 and -296; and P202W-304 to -305.

Door 202-D1 - Room 202

Layer	**Verbal**	**Munsell**
1.	Beige	10YR 8/2
2.	Varnish	7.5YR 4/6
3.	Cream	10YR 8/1
4.	Medium Grey	5Y 5/1
5.	Cream	
6.	Cream	
7.	Off White	

Notes

This door is unusual in that a varnish layer consistently showed on all samples at Layer 2. The color chronology also differs in comparison to other Room 202 millwork. Samples for this analysis include P202E-299 to -301.

Room 203 - Bedroom

There were some surprises found in this room as a result of the paint investigation. While the baseboards were found to consistently have a variety of paint colors, no other millwork came close to color selection or frequency of application. The paint analysis determined that the millwork of the single door and two windows thought to have been of nineteenth century integrity may in fact have been replaced during the early twentieth century, and renovated again in 1940. Consequently only the baseboards, chimney piece, and the two post casings, to some extent, can be relied upon to furnish some idea of the chromochronology for Room 203. Unfortunately paint layers and colors for these three millwork types were found to be too mixed to determine a general color scheme for the room. However, the baseboards probably furnish the most accurate chromochronology of any millwork type in Room 203.

Baseboards - Room 203

Layer	**Verbal**	**Munsell**
1.	Beige	10YR 8/2
2.	Light Grey	5BG 5/1
3.	Rosy Brown	10R 4/2
4.	Medium Brown	2.5YR 3/4
5.	Medium Grey	5Y 5/1
6.	Drab/Olive	2.5Y 5/4
7.	Cream	10YR 9/1
8.	Cream	10YR 9/2
9.	Cream	10YR 9/2
10.	Off White	N 9.25

Notes

All baseboards are historic based upon the paint analysis, and the chromochronology for each piece was found to be fairly consistent. Several colors were found between Layers 2 and 5 that do not seem to coincide with any other millwork in Room 203. It is not understood why there are so many more layers on the baseboards in comparison to the other millwork. Samples used for this analysis include P203N-235; P203E-239, -497, and -581; P203S-249; and P203W-255 and -258.

Door 203-D1 Panels - Room 203

Layer	Verbal	Munsell
1.	Beige	10YR 8/2
2.	Red Brown	5YR 4/6
3.	Medium Grey	5Y 5/1
4.	Cream	2.5Y 8.5/2
5.	Cream	10YR 9/2
6.	Off White	10YR 9/1

Door 203-D1 Rails and Casing - Room 203

Layer	Verbal	Munsell
1.	Beige	10YR 8/2
2.	Beige	10YR 8/2
3.	Drab/Olive	2.5Y 6/4
4.	Cream	10YR 9/2
5.	Cream	2.5Y 8.5/2
6.	Off White	10YR 9/1

Notes

Only one color outside of beige was found on the door rails and casing, but complimentary, bolder colors were found on the panels. This is the only door found on the house which displayed distinct color contrast. It is not understood how the door color schemes may have complimented the more complex chromochronologies found on the baseboards. It is very possible that the door surfaces have been stripped, or the door millwork has been completely replaced early during the twentieth century. The colors found on the door and window casings match very closely. Samples used for this analysis include P203E-240 through -242.

Windows 203-W1 and 203-W3 - Room 203

Layer	Verbal	Munsell
1.	Beige	10YR 8/2
2.	Beige	10YR 8/1
3.	Drab/Olive	5Y 6/2
4.	Cream	10YR 8/1
5.	Cream	10YR 9/2
6.	Cream	2.5Y 9/2
7.	Off White	N 9

Notes

Only two of the existing four window openings are historic. The paint analysis indicated that the chromochronology is very similar to that found on the casings and rails of Door 203-D1, but does not seem to compare with the color chronologies of other millwork in the room. As with the door, the windows may have been stripped or totally replaced early in the twentieth century. The sash of Window 203-W3 is known to have been replaced around 1915 by casement windows, yet the color chronology of the upper sash of the same window is identical to the casing of both windows. Samples used for this analysis include P203N-232, -233, and -580; and P203S-250.

Post Casings - Room 203

Layer	Verbal	Munsell
1.	Beige	10YR 7/2
2.	Light Grey	5Y 6/1
3a.	Beige	10YR 8/1
3b.	Terra Cotta	7.5R 6/6
4.	Pale Green	7.5GY 6/4
5.	Cream	10YR 9/1
6.	Cream	10YR 9/2
7.	Off White	10YR 9/1

Notes

It is not understood how the post casings may have complimented other millwork colors in this room especially when compared to the baseboards. It is possible that the casings were covered in wallpaper as determined in other areas of the house, and therefore were not painted for a time. In this analysis Layer 3 was sub-divided to account for the two distinct colors found at that layer on each of the two posts. The reason for this distinction is not known. Another anomaly was the presence of pale green on each of the casings at Layer 4. Samples used in this analysis include P203N-231 and P203S-253.

Chimney Piece - Room 203

Layer	**Verbal**	**Munsell**
1.	Beige	10YR 7/2
2.	Rosy Brown	2.5YR 4/2
3.	Black	N 0.75
4.	Medium Grey	5YR 6/1
5.	Drab/Olive	5Y 6/4
6.	Cream	10YR 9/1
7.	Cream	10YR 9/2
8.	Off White	10YR 9/1

Notes

Based upon the chromochronologies in other chimney pieces, this chimney piece is historic. The appearance of rosy brown in Layer 2 coincides with a very similar color found in Layer 3 of the baseboards. However, there is no evidence that a light grey or other complimentary color preceded the brown such as found on the baseboards and post casings. The black found on Layer 3 coincides with the same color found on the other historic chimney pieces. The analysis detected a bright red in the left leg trim at Layer 3 between the rosy brown and black. It is not understood how the red may have fit into the color schemes. Samples used for this analysis include P203W-256, -257, and -582.

BARN (HS-3)

There is yet no documentary evidence for the nineteenth and early twentieth century color of the barn. Except for the loft stable jack room, no other portion of the interior has painted finishes. However, there is physical evidence that the stable areas had been whitewashed. Several paint samples were removed from vertical boards beneath the existing plywood siding. Not surprisingly variations of reddish browns and red predominated the analysis, although one sample taken from the east elevation has an initial grey layer. It is unknown if the barn was indeed painted grey for a time as there is a possibility that this particular length of sampled siding was replaced. At this writing paint layers cannot be associated with a specific application date nor period. Given that the barn was subjected to the elements and rough treatment over its life, it is probable that the analysis failed to detect layers that pealed or washed from the siding. It is recommended that additional samples be analyzed when future work allows for the removal of the plywood siding. Paint samples used for this analysis include PN-546 and -547; PS-548 and -570; and PE-548.

Layer	**Verbal**	**Munsell**
1.	Medium Grey (?)	N 6.25
2.	Red Brown	7.5R 3/6
3.	Red	7.5R 4/12
4.	Orange Red/Red Brown	10R 5/8 / 7.5R 4/6
5.	Red/Brown	10R 4/4

ICE HOUSE (HS-4)

The wood frame portion of this outbuilding is believed to have been constructed by 1875. At this writing there is no historic documentation on the nineteenth nor early twentieth century color of the building. There is no evidence that the interior has ever been painted except for the south door. The lapped siding, cupola, and some soffit trim are believed to have survived intact. The south door is believed to have originated at the Hunt Addition of the Main House and moved to the Ice House about when the top of the Ice House was constructed. The following chromochronology was developed from four paint samples removed from the structure; two samples from each of the siding and the south door exterior surface. Because the Layer 1 cream color is absent from the door, the siding may have been primed prior to application of the first red paint, Layer 2. The first two color layers found on the door are believed to have been applied when it was still on the Main House. Samples used for this analysis include PS-536 through -539.

Layer	Verbal	Munsell
1.	Cream	10YR 8/2
2.	Brown Red	7.5R 3/4
3.	Off White	N 9
4.	Off White	N 9
5.	Brick Red	7.5R 3/4
6.	Brick Red	5R 3/4

CHICKEN HOUSE (HS-5)

This structure is believed to have been constructed by the 1890s; there is no written documentation on the historic colors at this writing. A single layer of whitewash was found at the interior, Munsell 10YR 8/1 (PW-544 and PS-545). Four exterior samples removed from the vertical siding and door were very consistent in color and chronology. The samples used for the following analysis include PS-540 and -541; and PW-542 and -543.

Exterior Siding and Door Surfaces

Layer	Verbal	Munsell
1.	White	N 9.5
2.	Red	7.5R 4/12
3.	Brown Red	10R 3/4
4.	Brick Red	7.5R 3/6

APPENDIX E - WALLPAPER

Four sections of what are believed to be historic wallpaper finishes were donated to the Park by Bill Wenzlick in 1992. According to Wenzlick the samples were probably saved by his father during 1940 renovation work on the Main House when most of the plaster finishes were removed from walls and ceilings. Wenzlick found the samples in a storage drawer he inherited upon his father's death, and believes that they came from the "dining room" (Room 103).

Careful examination of three similar samples revealed each to have three dissimilar patterned Layers of paper, measure 3½" in width (but vary in length between 12" and 14"), each has black paint smears on one edge and terra cotta paint smears on the opposite edge. Each also has small puncture holes surrounded by rusty, circular stains along the edges, indicating that nails or tacks had penetrated the papers.

Examination of available twentieth century interior photographs and the existing wall surfaces revealed that there is a high probability that the three samples originated from between the chimney piece at Fireplace FP3 and Door 103-D3. A 1916 photograph of that area of Room 103 indicates that fabric finishes had been tacked to the wall surfaces. Although the fabric finishes conceal from photographic view any papers beneath, the tack locations match favorably with those found on the three extant samples. The second paint Layer on the adjacent chimney piece was found to have been painted black (paint samples P103(W)-88, 89, and 93), and the third paint Layer on door 103-D3 was found to match favorably with the terra cotta smears found on the opposite edge of the paper (paint sample P103(W)-85).

It is unknown where the slightly wider fourth sample may have come from, but it is suspected that it was taken from somewhere within Room 103 as the three styles of Layered paper are similar if not identical to those found in the previously discussed three samples.

Two of the samples were sent to Assistant Curator Joanne Kosuda-Warner, Wallcoverings Department, of the Cooper-Hewitt Museum for analysis. The goals were to determine for each of the paper Layers; the manufacture period, origin of manufacture, and repeat pattern based upon known samples. It was hoped that the papers would disclose relative dates of interior decoration or renovation work, and maybe even reveal personal traits about the person or family who installed the papers. It is known that Door 103-D3 was not in existence until it was installed to provide access to the West Wing which was added to the Long House around 1840. So it was suspected that the first paper Layer may have been hung between the chimney piece at Fireplace FP3 and door at the time the West Wing was added.

In summary, the analysis determined the following:

First paper Layer: Oak leaf design block printed in two colors. The paper was manufactured during the 1840s, possibly in the United States.

Second paper Layer: Stripe with scrolling elements design block printed in green, white, and grey. The paper was manufactured during the 1840s and 1850s. Unfortunately the samples are too deteriorated for complete analysis.

Third paper Layer: Rococo-Revival foliated pattern printed on a polished "satin" ground. The paper was probably block printed and manufactured in France circa 1845 to 1855.

All of the papers were probably purchased through a St. Louis merchant. An early St. Louis wallcovering dealer, G.B. Michael's Paper Hangings Warehouse, St. Louis, was referenced in the report as a possible source for the wallpapers.[1] The 1850 St. Louis directory advertisement specifically states the availability of American and French papers at the shop.

The reprinted correspondence of the analysis provide by Joanne Kosuda-Warner is enclosed. However, enclosures with the correspondence have not been included here as their clarity is poor.

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[1] *St. Louis Business Directory*, (1841), 173, *Taylor's St. Louis Business Directory*, (1850), 86, and *St. Louis Directory*, (1859), n.p. These directories are referenced in the Cooper-Hewitt Museum report.

APPENDIX F - ASBESTOS SURVEY

In 1991 the St. Louis firm ATC Environmental Inc. was contracted by the National Park Service to survey the extent of asbestos bearing materials on the Main House complex, Barn, Icehouse, and Chicken House. The intent of the survey was to sample and analyze materials suspected of containing asbestos prior to commencement of any physical investigation or construction work. Materials sampled included plaster, gypsum wall board, electrical, building, and duct insulation, vinyl floor finishes, thermal mortars, caulks, and roofing materials.

Of 97 samples analyzed, the firm identified several asbestos bearing building materials. It must be noted that since completion of the report, asbestos bearing duct tape has been found on the corner joints of insulation covering all duct risers encased in the walls of Hall 102 and Hall 202 during physical investigation work. The tape is friable while all other asbestos bearing materials were deemed non-friable. The following schedule summarizes asbestos bearing materials indicated in the October 16, 1991 *Asbestos Assessment Survey.*

Buliding	**Material**	**Location**	**Asbestos % Content**
Main House	Roof shingles	Entire roof	30-40
	Flashing	Roof	10
	Tar	Roof	15
	Cement patch	Flue opening, Rm 002	10
	Mortar patch	Flue opening, Rm 002	20
	Duct tape	Living room 101	45
	Floor tile	Kitchen 109	3
Icehouse	Roof shingles	Entire roof	30-40
Chicken house	Roof shingles	Entire roof	30-40
Barn	None detected		

APPENDIX G - SOILS SURVEY

Three soil bores were drilled around the Main House near the foundation in July 1992. The intent of the survey was to determine soil compressive strength, presence of ground water, soil permeability, and seismic characteristics. The report "Exploration of Subsurface Conditions and Foundation Recommendations" submitted by Soil Consultants, Inc., St. Peters, Missouri, is reproduced in its entirety in this Appendix. In summary, two test holes reached refusal at limestone at between 13 and 15 feet in depth but no ground water was encountered.

APPENDIX H - PREVIOUS SITE PLANS

The site plans discussed here were produced during the second half of the twentieth century, and those displayed are limited by the inclusion of structures. However, other known twentieth century site plans that do not include structures are described in this appendix. Other than the hand drawn U.S. Grant site plan of White Haven shown in Historical Background and Context of Division II, no nineteenth century site plans and plats have been located that include site structures. It is hoped that future intensive research may yield additional drawings of that nature.

Forest Haven No. 4

This three sheet set is dated May 1962 and prepared by Joyce Company. The first sheet is labeled Sanitary Sewer Plan, and includes boundaries of the historic site and adjacent property. The second sheet is labeled Paving Plan and includes a site plan of road and sewer layouts for streets surrounding the historic site including Fernald Drive, Appomatox Court, and White Haven Drive. No structures are shown but the storm culvert at the northeast corner of the property is included. The third sheet has sanitary and storm sewer profiles for the above mentioned streets. Blue prints of this drawing set were donated to the park by Bill Wenzlick and are currently in park collections.

1988 Boundary Map

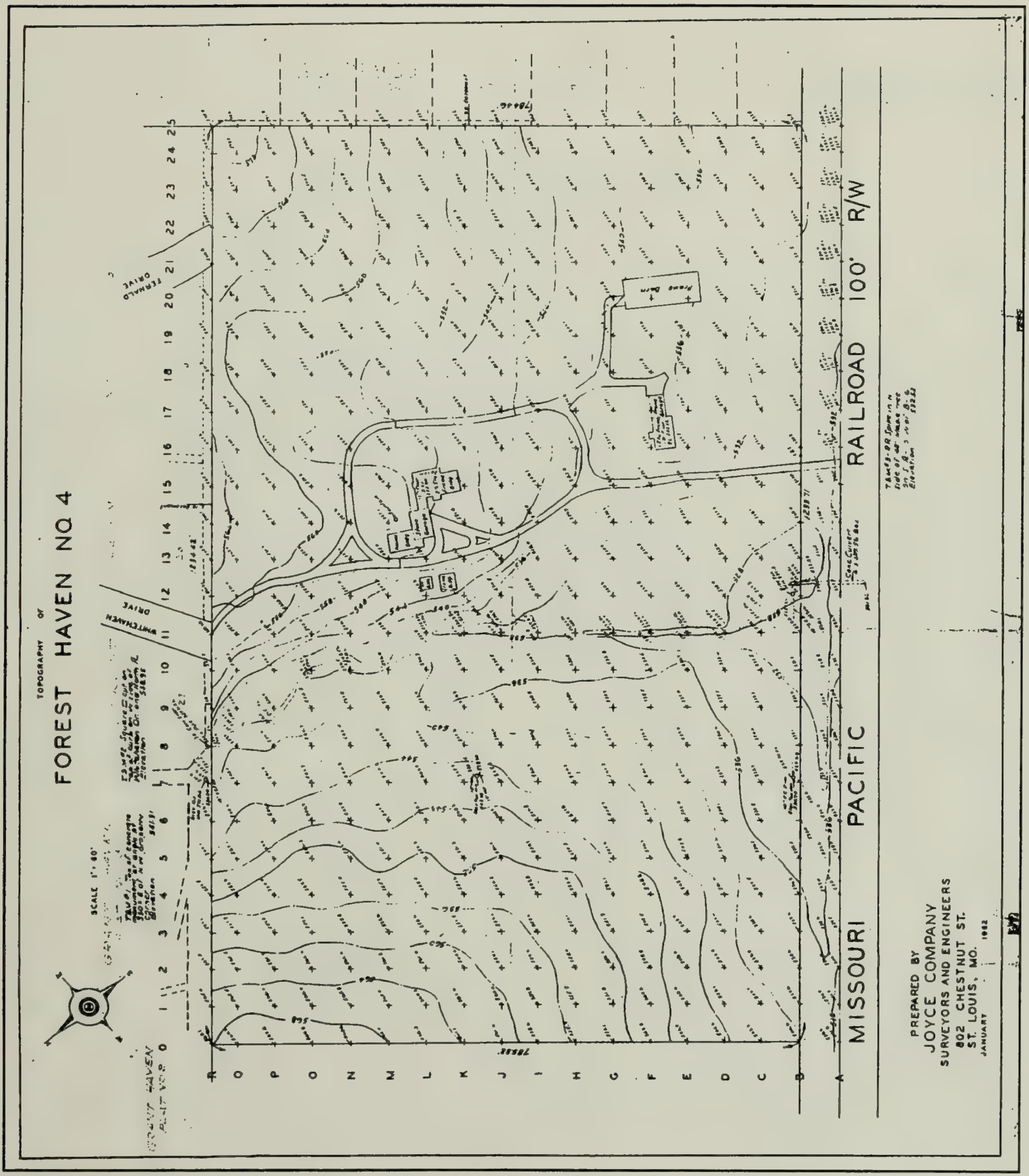
Dated July 1988 and numbered WHHA 80,000, this sheet was prepared by the National Park Service, Midwest Regional Office prior acquisition of the property by the NPS. The drawing only shows park and adjacent property line borders. The original copy is at the Midwest Regional Office, Omaha, Nebraska; a copy is in park collections.

1992 Site Survey

An extremely detailed site survey was prepared for the National Park Service by CMLAV Inc. under subcontract to Thalden Corporation. Included on the drawing are all trees, topography, structures, pavements, site utilities and boundaries, adjacent property and roads. Although the site plan portion of the drawing sheet is shown on Sheet 2 of the existing conditions drawings (see Division 2), the full content of the E size drawing is too large to be reproduced for this document. The drawing is plotted to AutoCAD and is in park collections.

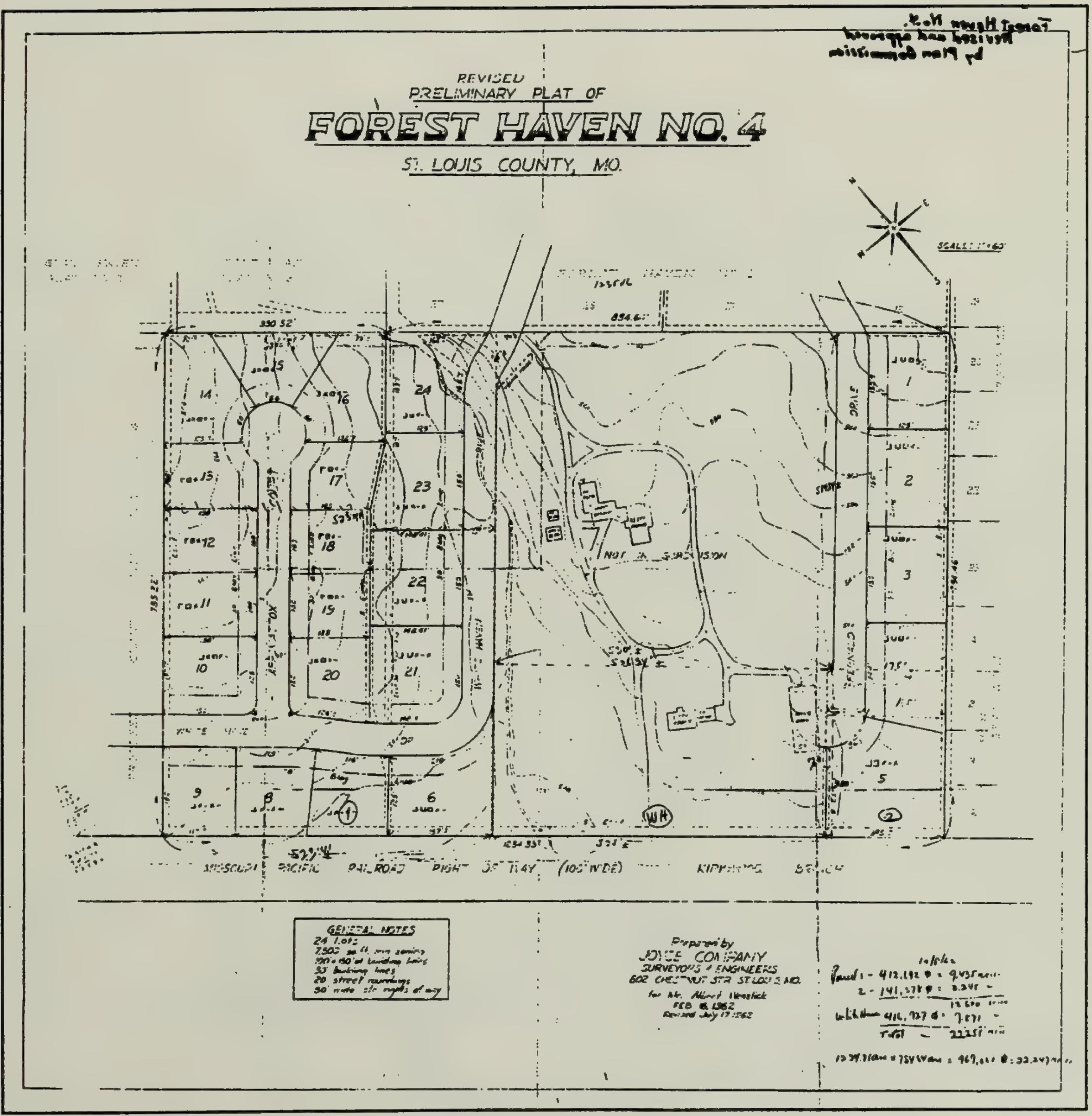
Topography of Forest Haven No. 4

An extensive topographic survey was prepared January 1962 for White Haven and the Forest Haven sub-division property by the Joyce Company. The drawing is significant in that it shows the former location of the Barn (HS-3) and topography of Forest Haven prior to extensive housing development. A blue print of this drawing was donated to the park by Bill Wenzlick and is in park collections.


TOPOGRAPHY OF
FOREST HAVEN NO 4
SCALE 1"=80'
WHITEHAVEN DRIVE
FERNANDO DRIVE
MISSOURI PACIFIC RAILROAD 100' R/W
PREPARED BY
JOYCE COMPANY
SURVEYORS AND ENGINEERS
802 CHESTNUT ST.
ST. LOUIS, MO.
JANUARY 1932
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
A B C D E F G H I J K L M N O P Q R

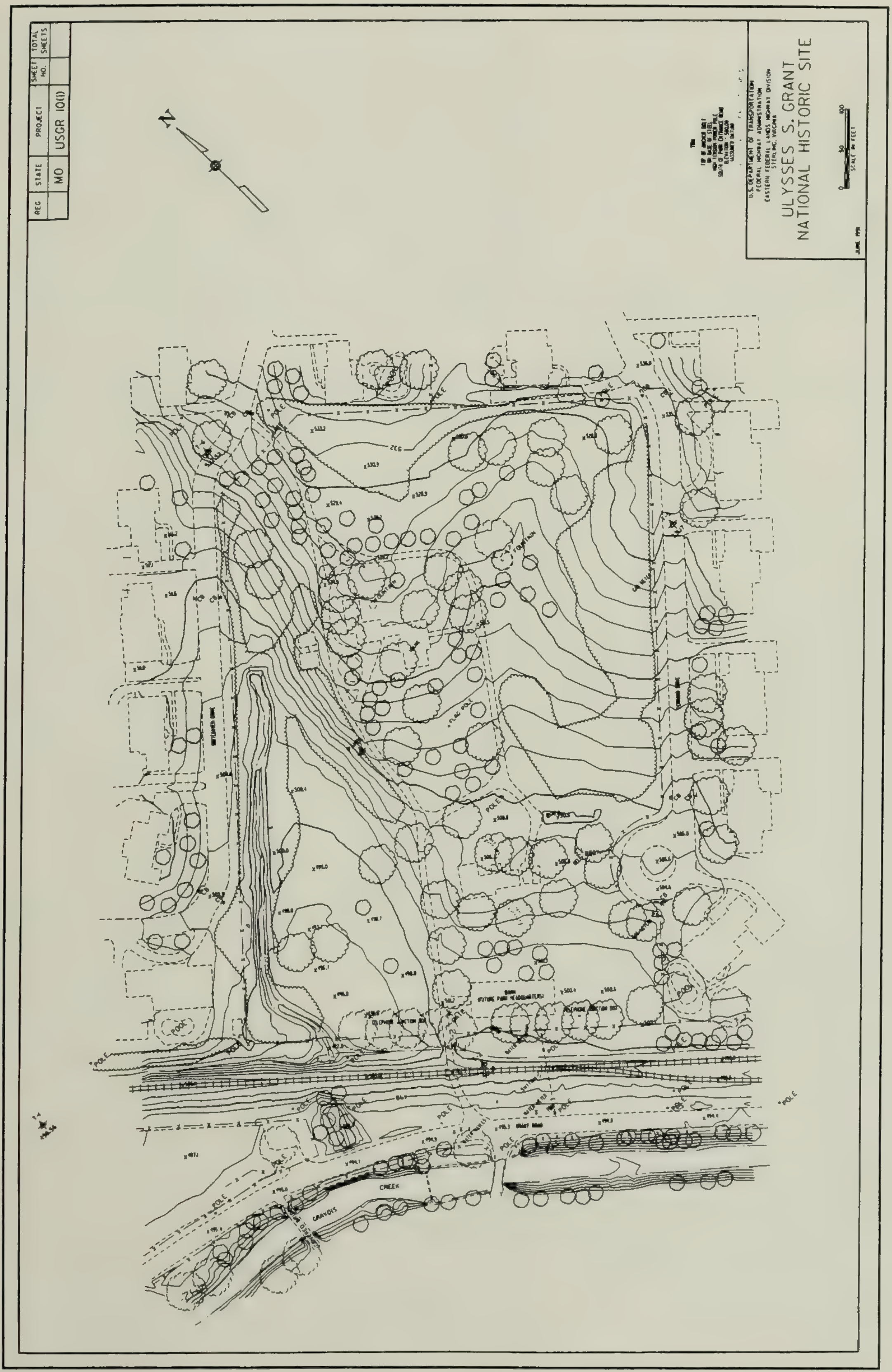
Revised Preliminary Plat of Forest Haven No. 4

This drawing was prepared February 16, 1962 by the Joyce Company and includes topographic lines and layout of sub-division streets and property surrounding the park. A blue print of this drawing was donated to the park by Bill Wenzlick and is in park collections.


Forest Haven No.4
Revised and approved
by Plan Commission
REVISED
PRELIMINARY PLAT OF
FOREST HAVEN NO. 4
ST. LOUIS COUNTY, MO.
N
E
S
SCALE 1"=60'
NOT IN SUBDIVISION
MISSOURI PACIFIC RAILROAD RIGHT OF WAY (105' WIDE)
KIRKHAVEN BRANCH
GENERAL NOTES
24 Lots
7,500 sq. ft. min. zoning
120'x150' at building lines
35' building lines
20 street roundings
50' wide str. rights of way
Prepared by
JOYCE COMPANY
SURVEYORS & ENGINEERS
602 CHESTNUT STR. ST. LOUIS MO.
for Mr. Albert Wenslick
FEB 6 1962
Revised July 17 1962
Parcel 1 - 412,192 ☐ = 9.435 acres
2 - 141,578 ☐ = 3.245 acres
12.680 acres
W.H. - 416,737 ☐ = 7.671
Total - 22.351 acres
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

1991 Boundary Plan

A boundary plan of the site was completed in 1991 by the United States Department of Transportation (NPS Drawing No. 357/80001). The drawing was produced from aerial photographs taken during a 1991 flyover. The plan includes major elements and trees, topography and fences but has been found to be inaccurate in placement of some features and inadequate in scope. A vellum copy of the drawing is in park collections.


REG
STATE
MO
PROJECT
USGR 10(1)
SHEET NO.
TOTAL SHEETS
N
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
EASTERN FEDERAL LANDS HIGHWAY DIVISION
STERLING, VIRGINIA
ULYSSES S. GRANT
NATIONAL HISTORIC SITE
0
50
100
SCALE IN FEET
POLE
FLAG POLE
FOUNTAIN
POOL
BARN
(FUTURE PARK HEADQUARTERS)
CREEK
GRAVOIS

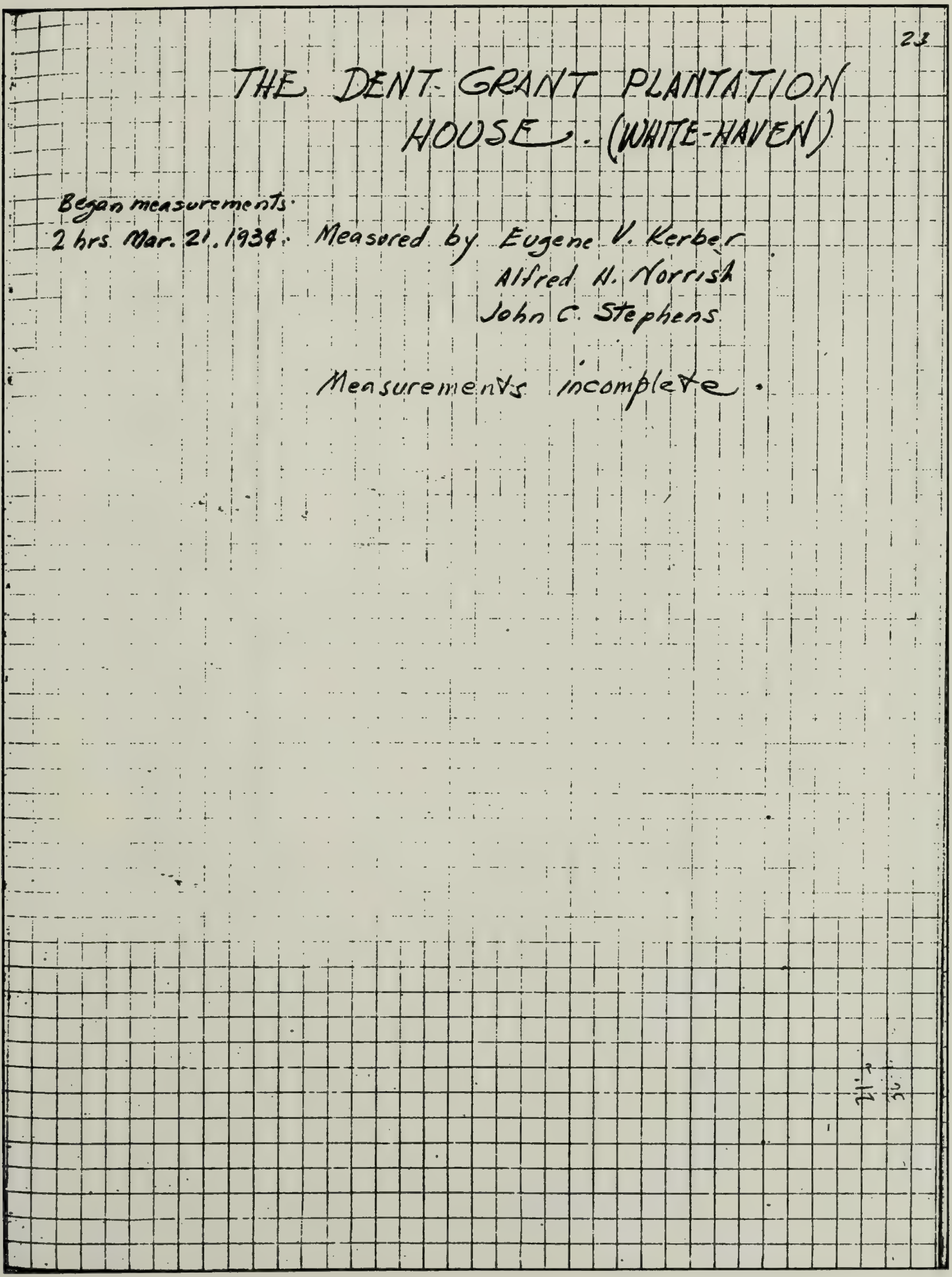
APPENDIX I - PREVIOUS DRAWINGS AND SKETCHES

While no nineteenth century drawings are known to exist for structures on the site, numerous drawings were developed for the Main House and ancilary Stone Building during the mid-twentieth century. A Historic American Building Survey (HABS) crew visited the site in 1934, but no formal drawings were produced, and only scant field notes were recorded. Another HABS team visited the site in 1940 and recorded the Main House during demolition of some portions of the house. About that same time Delbert Wenzlick initiated the generation of several sets of alternative design and construction drawings for rehabilitation of the Main House. After completion of the rennovation work, very few drawings were completed until HABS again visited the site in 1991. Of the five singular drawing sheets completed after 1940, the Metcalf and Hayes drawings are significant in that they document nineteenth century character of the Main House and Stone Building.

Copies of all of the following drawings, and in some cases the original drawings, are in park collections.

1934 HABS Field Notes

Three field note sheets dated March 21, 1934 were found in the Library of Congress, HABS collections. The set includes a title sheet (page 23), a first floor footprint plan with only a few dimensions of the front porch (page 25), and an incomplete perimeter plan of what is believed to be the second floor with no dimensions (page 27). The title sheet notation that two hours were expended on site reveals the reason for the field note's incompleteness. Copies of the field notes are in the Jefferson National Expansion Memorial and park collections.

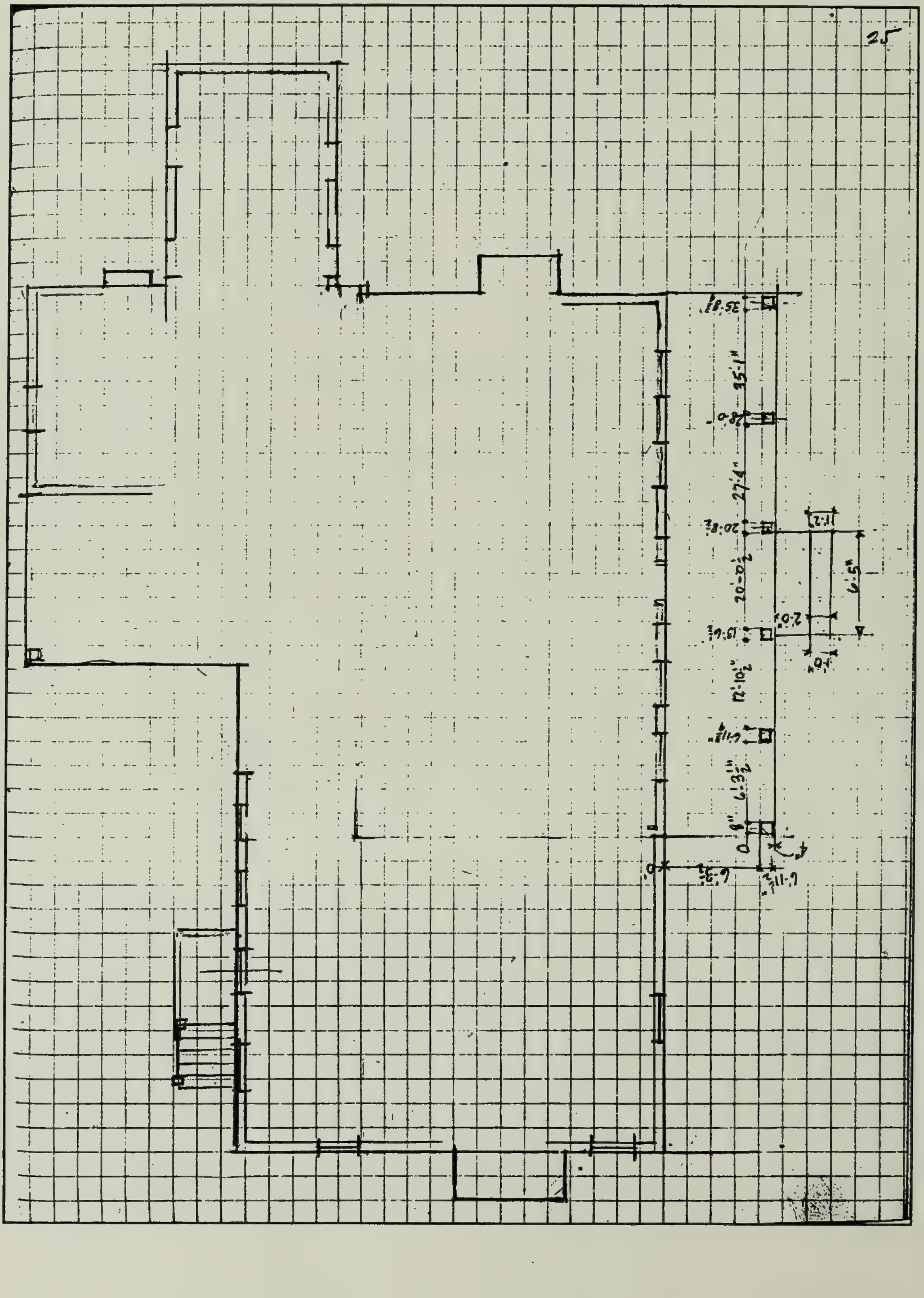


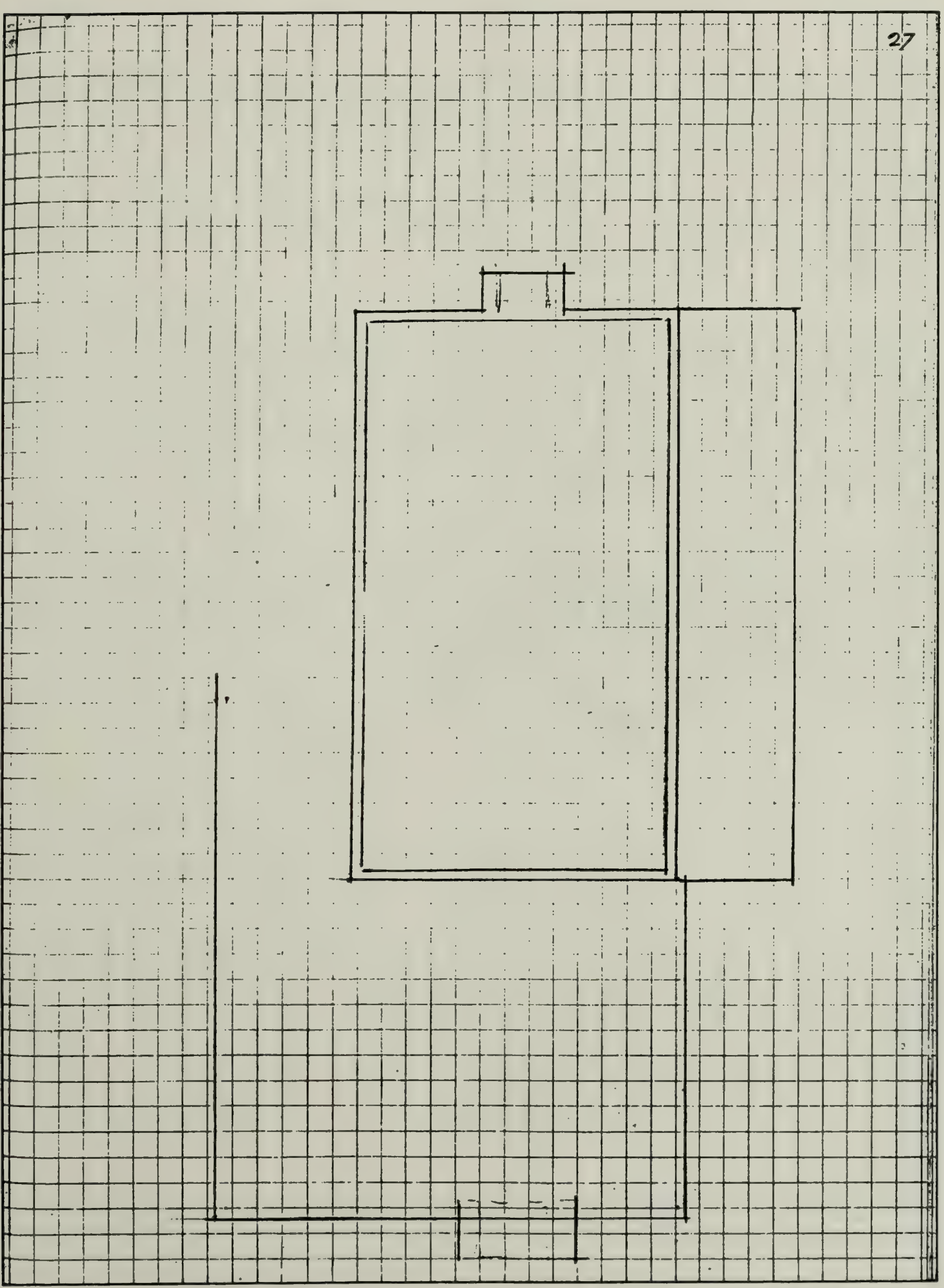
23

THE DENT-GRANT PLANTATION
HOUSE. (WHITE-HAVEN)

Began measurements:
2 hrs. Mar. 21, 1934. Measured by Eugene V. Kerber.
Alfred H. Norrish
John C. Stephens

Measurements incomplete.


25
35'8"
35'1"
28'0"
27'4"
20'8½"
20'0½"
19'6½"
12'10½"
6'11½"
6'3½"
0'8"
0
6'3½"
6'11½"
1'2"
6'5"
2'0"
1'0"


27

1940 HABS Documentation

A Historic American Building Survey (HABS) team prepared three drawing sheets (MO-1150) and twenty one photographs (112179-HABS.MO 95-AFT) of the site in 1940 (See 1940 HABS Drawings). The drawings concentrated solely on the house while photographs were taken of structures extant today. Fortunately, this documentation occurred during Wenzlick demolition of the historic Hunt Addition and East Wing. Dimensional inaccuracies in the ⅛ in. scale floor plans may have been due to the limited scope and budget imposed on that HABS team.[1] No elevations were produced and most of their labor seems to have been directed toward detailing interior millwork such as the doors, windows, and fireplace mantles. Field notes for the 1940 documentation have never been located.

The photographs are the most valuable record of the set. Of particular interest are the photos taken during demolition of the Hunt Addition which show the structural system and give some idea of interior character. These photos proved to be very useful in the development of reconstruction drawings for the Hunt Addition and East Wing additions. The interior photographs of the house are also useful as there only three known photographs of the interior taken during Wenzlick occupation prior to 1940.

The 1940 documentation also includes one "Physical Data" and one "Historical Data" sheet prepared on October 26, 1940 by F. Ray Leimkuehler. Both sheets are very general. The preparer relied upon the knowledge of Delbert Wenzlick for the historical data sheet; there are numerous inaccuracies in the text. Copies of both sheets are in the collection of Jefferson National Expansion Memorial, St. Louis.

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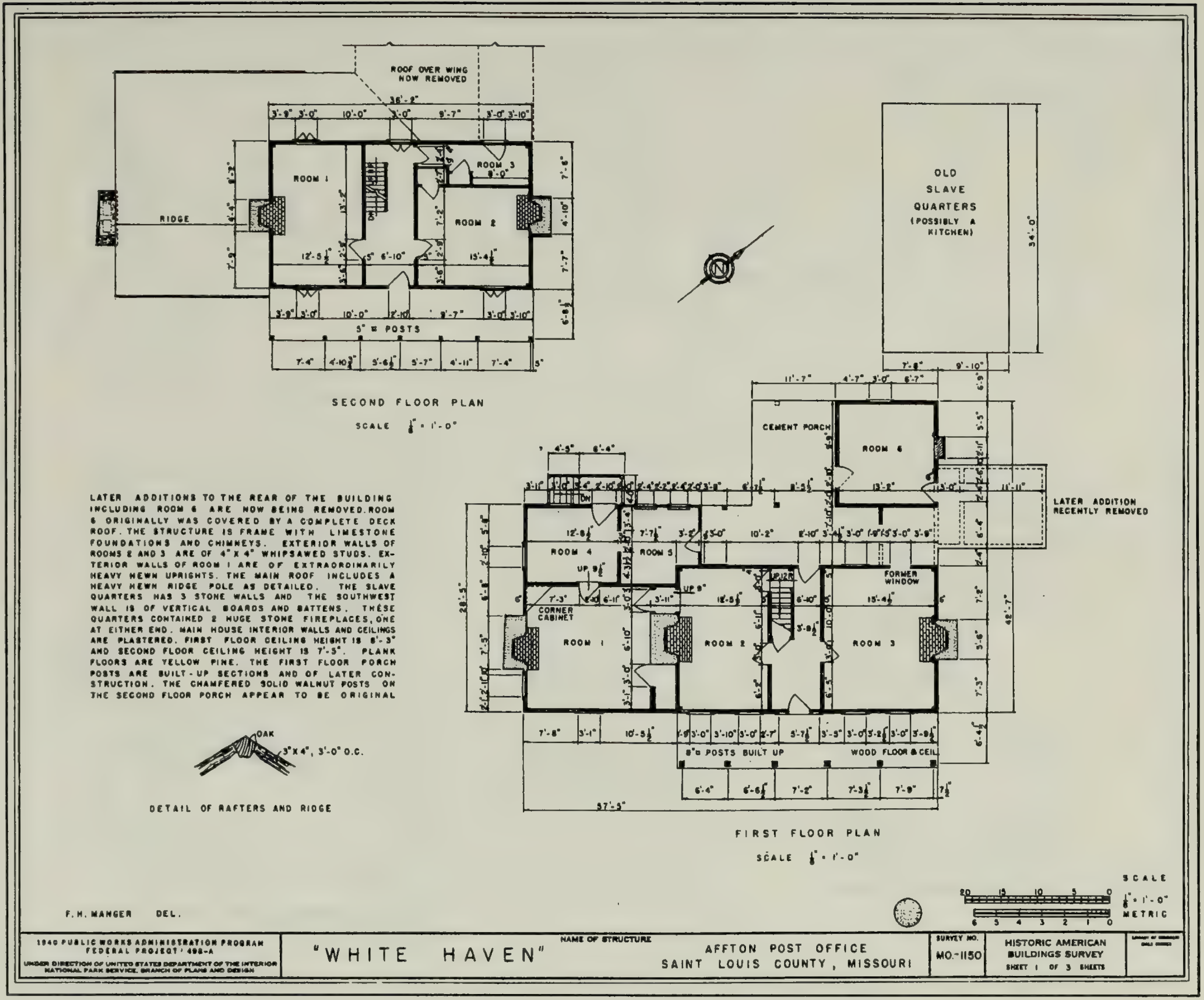
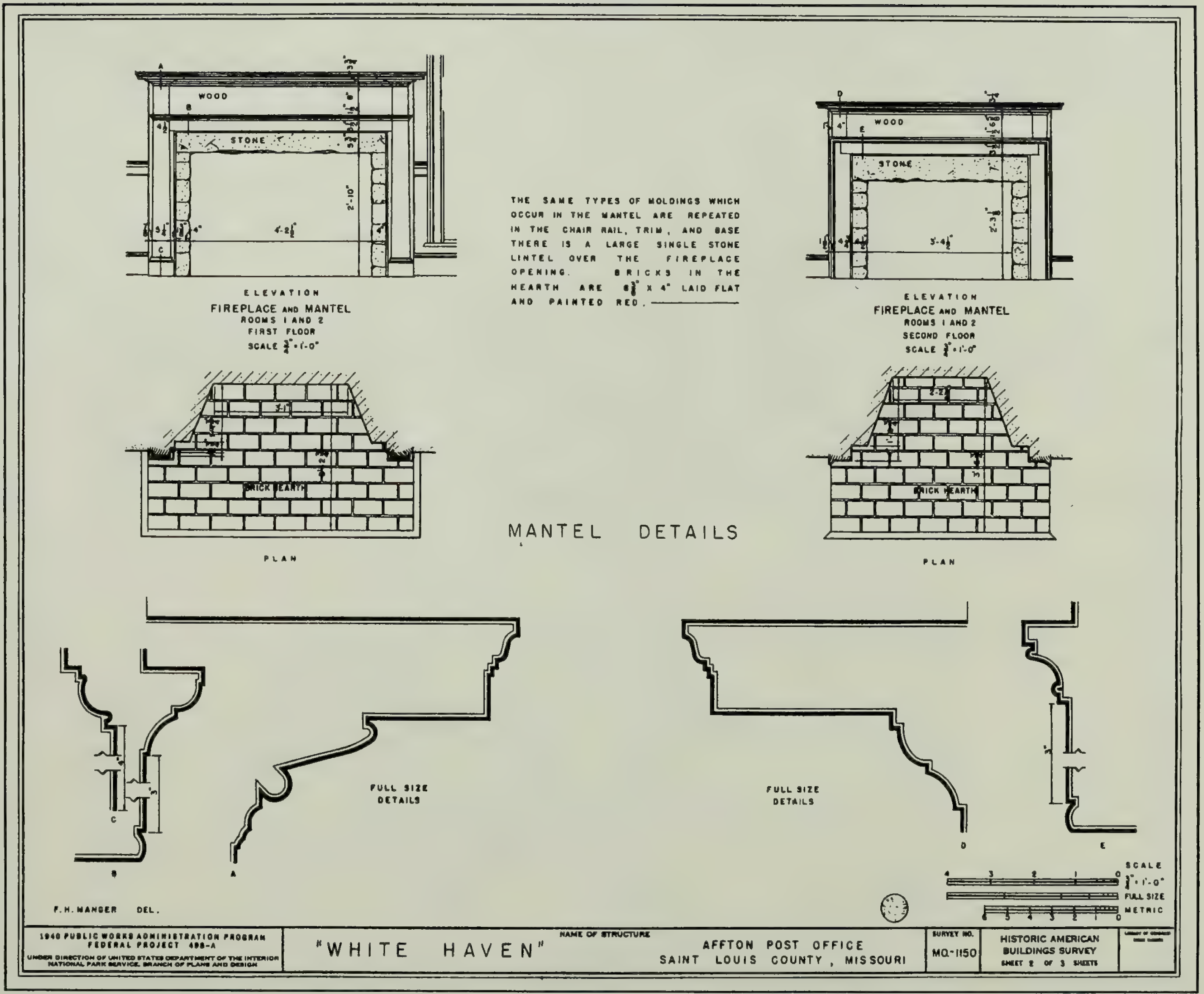
[1] An error in fireplace description must be noted on Sheet 2. The general note states that "there is a large single stone lintel over the fireplace opening," but does not refer to any particular fireplace although the two fireplace elevations are graphically depicted. In fact, there is only one existing fireplace with a single stone lintel, FP3 in Dining Room 103. The remainder are of a composite stone jack arch supplemented by an iron bar lintel. There is no indication that the composite lintels are not original to the house. This error may be another indication that the 1940 HABS team hurried during their field visit.


ROOF OVER WING NOW REMOVED
36'-2"
ROOM 1
ROOM 2
ROOM 3
RIDGE
5" ▫ POSTS
SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"
OLD SLAVE QUARTERS (POSSIBLY A KITCHEN)
34'-0"
CEMENT PORCH
ROOM 6
LATER ADDITION RECENTLY REMOVED
ROOM 4
ROOM 5
UP
DN
FORMER WINDOW
CORNER CABINET
ROOM 1
ROOM 2
ROOM 3
28'-3"
48'-7"
57'-5"
8"▫ POSTS BUILT UP
WOOD FLOOR & CEIL
FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"
OAK
3"X 4", 3'-0" O.C.
DETAIL OF RAFTERS AND RIDGE
SCALE
1/8" = 1'-0"
METRIC
F. H. MANGER DEL.
1940 PUBLIC WORKS ADMINISTRATION PROGRAM
FEDERAL PROJECT 498-A
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN
NAME OF STRUCTURE
SURVEY NO.
MO.-1150
HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 1 OF 3 SHEETS

LATER ADDITIONS TO THE REAR OF THE BUILDING INCLUDING ROOM 6 ARE NOW BEING REMOVED. ROOM 6 ORIGINALLY WAS COVERED BY A COMPLETE DECK ROOF. THE STRUCTURE IS FRAME WITH LIMESTONE FOUNDATIONS AND CHIMNEYS. EXTERIOR WALLS OF ROOMS 2 AND 3 ARE OF 4" X 4" WHIPSAWED STUDS. EXTERIOR WALLS OF ROOM 1 ARE OF EXTRAORDINARILY HEAVY HEWN UPRIGHTS. THE MAIN ROOF INCLUDES A HEAVY HEWN RIDGE POLE AS DETAILED. THE SLAVE QUARTERS HAS 3 STONE WALLS AND THE SOUTHWEST WALL IS OF VERTICAL BOARDS AND BATTENS. THESE QUARTERS CONTAINED 2 HUGE STONE FIREPLACES, ONE AT EITHER END. MAIN HOUSE INTERIOR WALLS AND CEILINGS ARE PLASTERED. FIRST FLOOR CEILING HEIGHT IS 8'-3" AND SECOND FLOOR CEILING HEIGHT IS 7'-5". PLANK FLOORS ARE YELLOW PINE. THE FIRST FLOOR PORCH POSTS ARE BUILT-UP SECTIONS AND OF LATER CONSTRUCTION. THE CHAMFERED SOLID WALNUT POSTS ON THE SECOND FLOOR PORCH APPEAR TO BE ORIGINAL

"WHITE HAVEN"

AFFTON POST OFFICE
SAINT LOUIS COUNTY, MISSOURI



MANTEL DETAILS

ELEVATION
FIREPLACE AND MANTEL
ROOMS 1 AND 2
FIRST FLOOR
SCALE ¾" = 1'-0"

ELEVATION
FIREPLACE AND MANTEL
ROOMS 1 AND 2
SECOND FLOOR
SCALE ¾" = 1'-0"

THE SAME TYPES OF MOLDINGS WHICH OCCUR IN THE MANTEL ARE REPEATED IN THE CHAIR RAIL, TRIM, AND BASE THERE IS A LARGE SINGLE STONE LINTEL OVER THE FIREPLACE OPENING. BRICKS IN THE HEARTH ARE 6⅜" X 4" LAID FLAT AND PAINTED RED.

F. H. MANGER DEL.

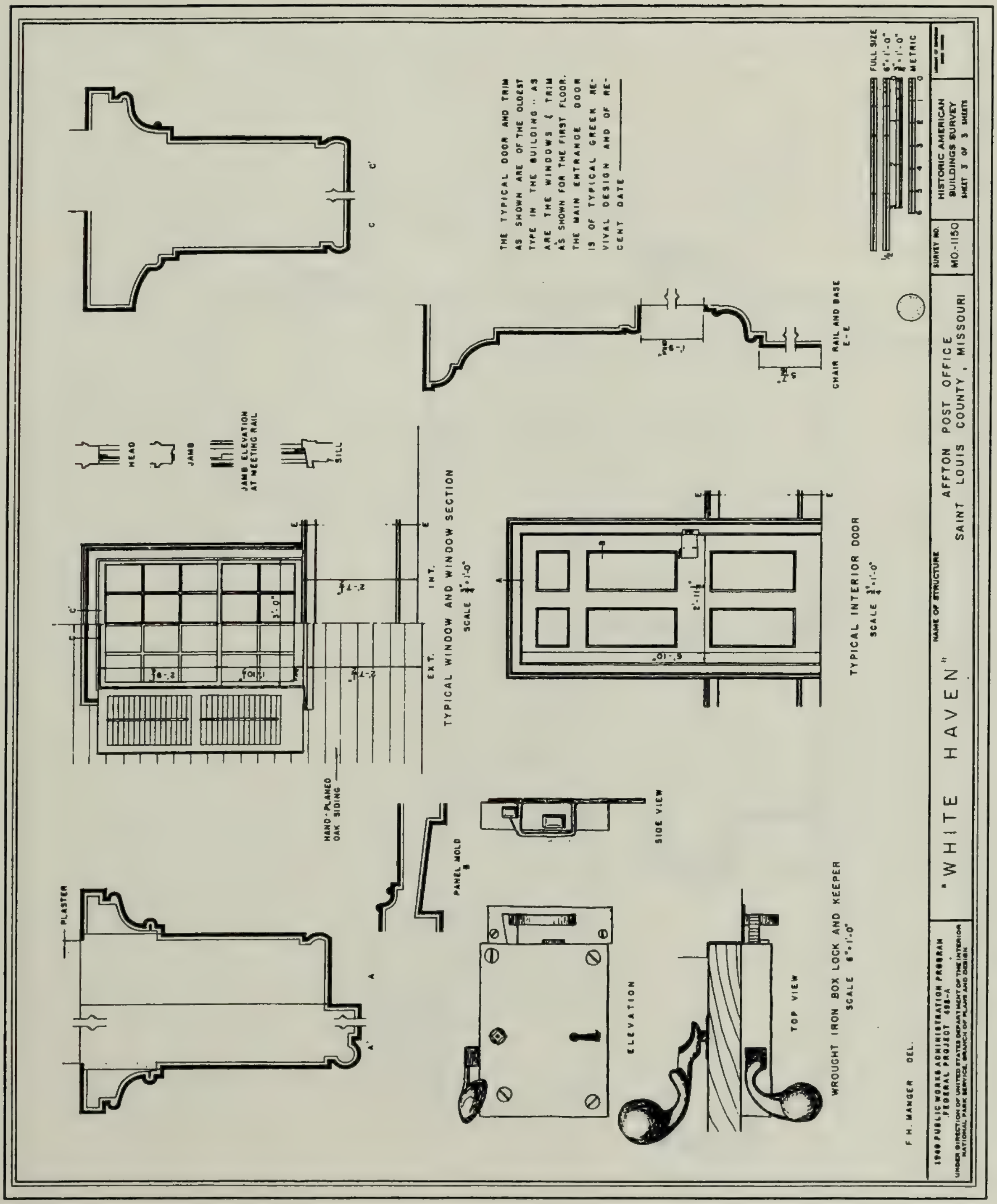
1940 PUBLIC WORKS ADMINISTRATION PROGRAM
FEDERAL PROJECT 498-A
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
"WHITE HAVEN"
AFFTON POST OFFICE
SAINT LOUIS COUNTY, MISSOURI

SURVEY NO.
MO-1150

HISTORIC AMERICAN
BUILDINGS SURVEY
SHEET 2 OF 3 SHEETS

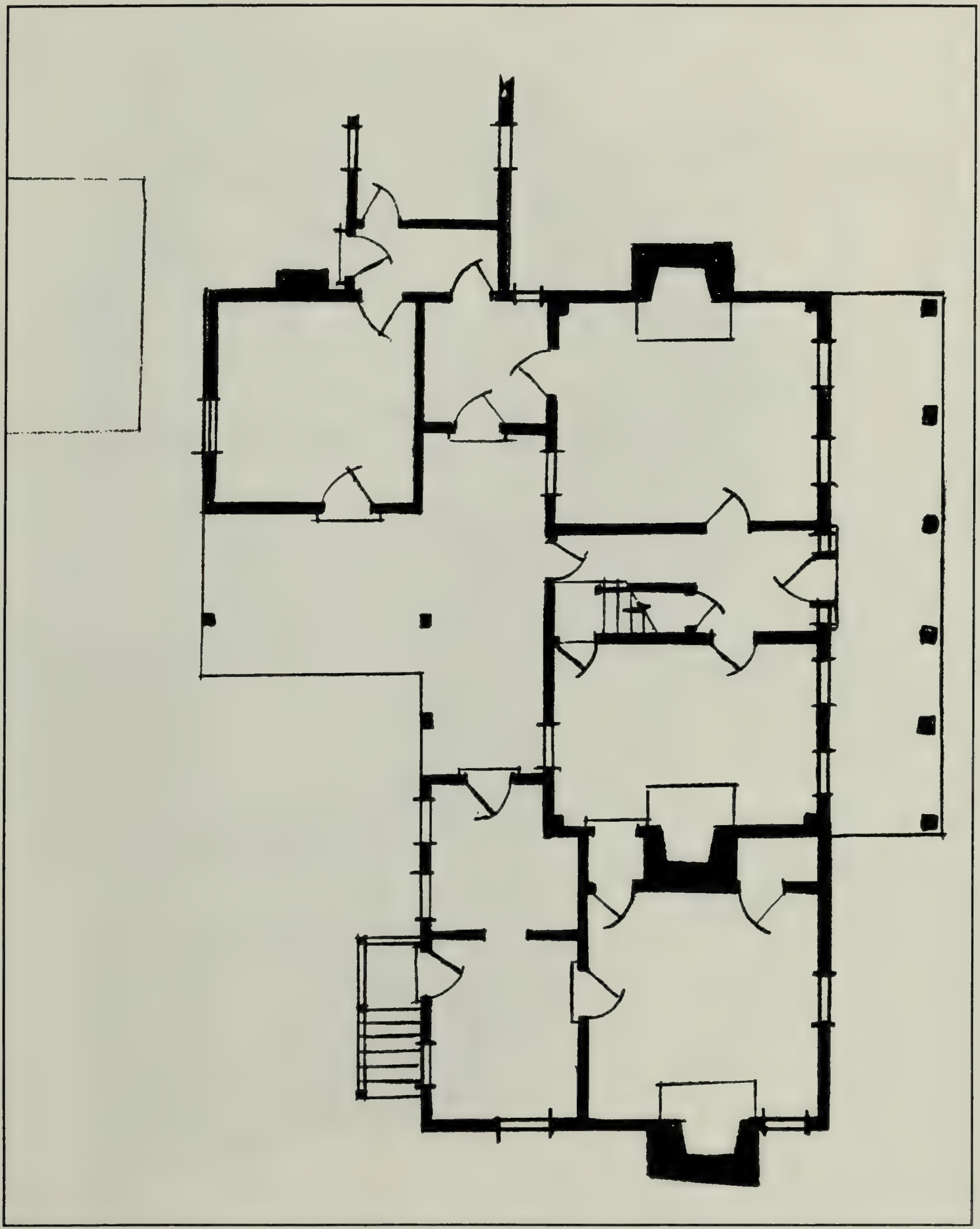
WOOD
STONE
A
B
C
D
E
2'-10"
4'-2½"
2'-3½"
3'-4½"
PLAN
BRICK HEARTH
PLAN
BRICK HEARTH
FULL SIZE DETAILS
FULL SIZE DETAILS
SCALE
¾" = 1'-0"
FULL SIZE
METRIC

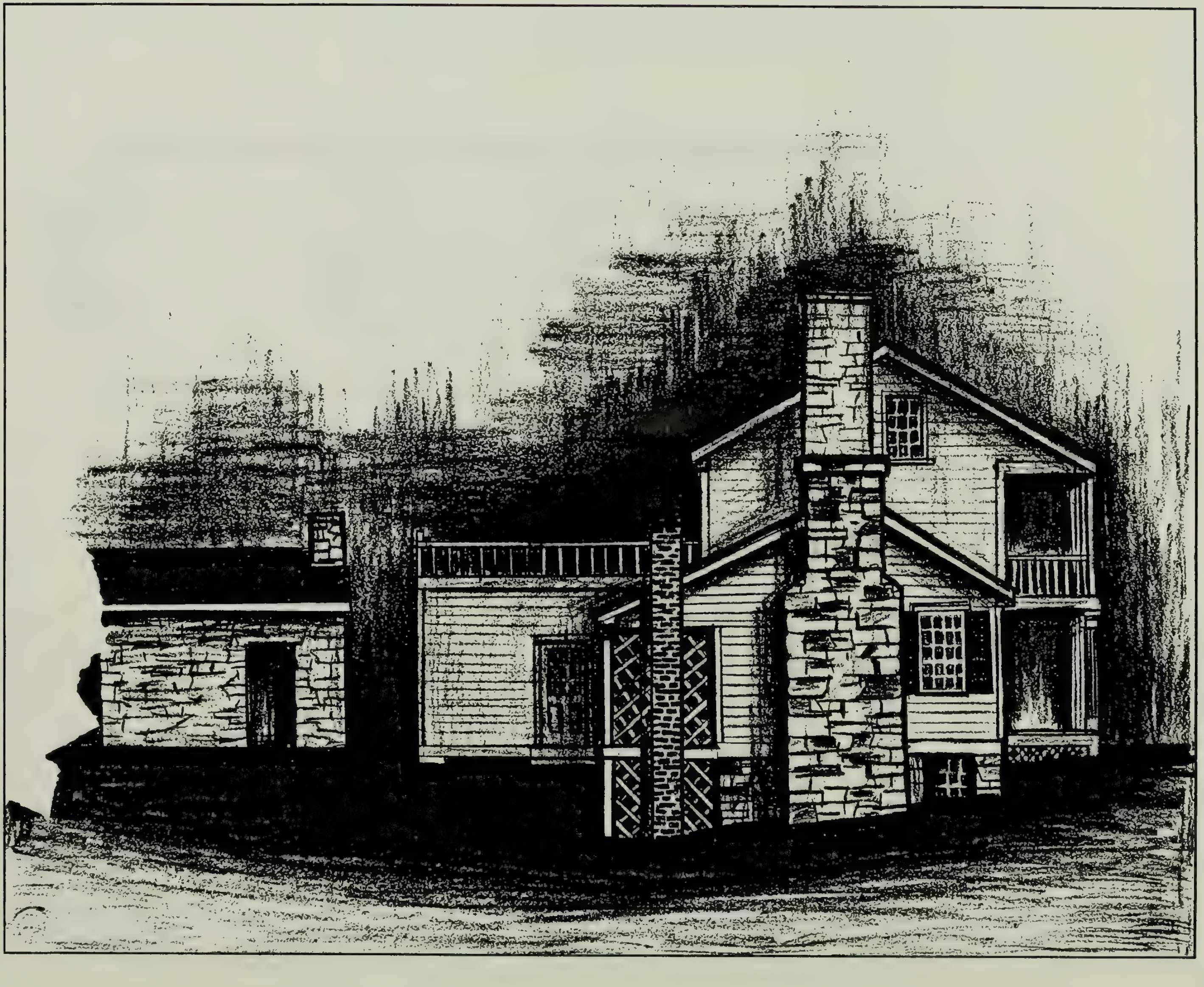

THE TYPICAL DOOR AND TRIM AS SHOWN ARE OF THE OLDEST TYPE IN THE BUILDING :: AS ARE THE WINDOWS & TRIM AS SHOWN FOR THE FIRST FLOOR. THE MAIN ENTRANCE DOOR IS OF TYPICAL GREEK REVIVAL DESIGN AND OF RECENT DATE
PLASTER
HAND-PLANED OAK SIDING
HEAD
JAMB
JAMB ELEVATION AT MEETING RAIL
SILL
EXT.
INT.
TYPICAL WINDOW AND WINDOW SECTION
SCALE ¾"=1'-0"
PANEL MOLD B
SIDE VIEW
ELEVATION
TOP VIEW
WROUGHT IRON BOX LOCK AND KEEPER
SCALE 6"=1'-0"
TYPICAL INTERIOR DOOR
SCALE ¾"=1'-0"
CHAIR RAIL AND BASE E-E
FULL SIZE
METRIC
F. H. MANGER DEL.
1940 PUBLIC WORKS ADMINISTRATION PROGRAM FEDERAL PROJECT 498-A
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN
NAME OF STRUCTURE
"WHITE HAVEN"
AFFTON POST OFFICE
SAINT LOUIS COUNTY, MISSOURI
SURVEY NO.
MO-1150
HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 3 OF 3 SHEETS

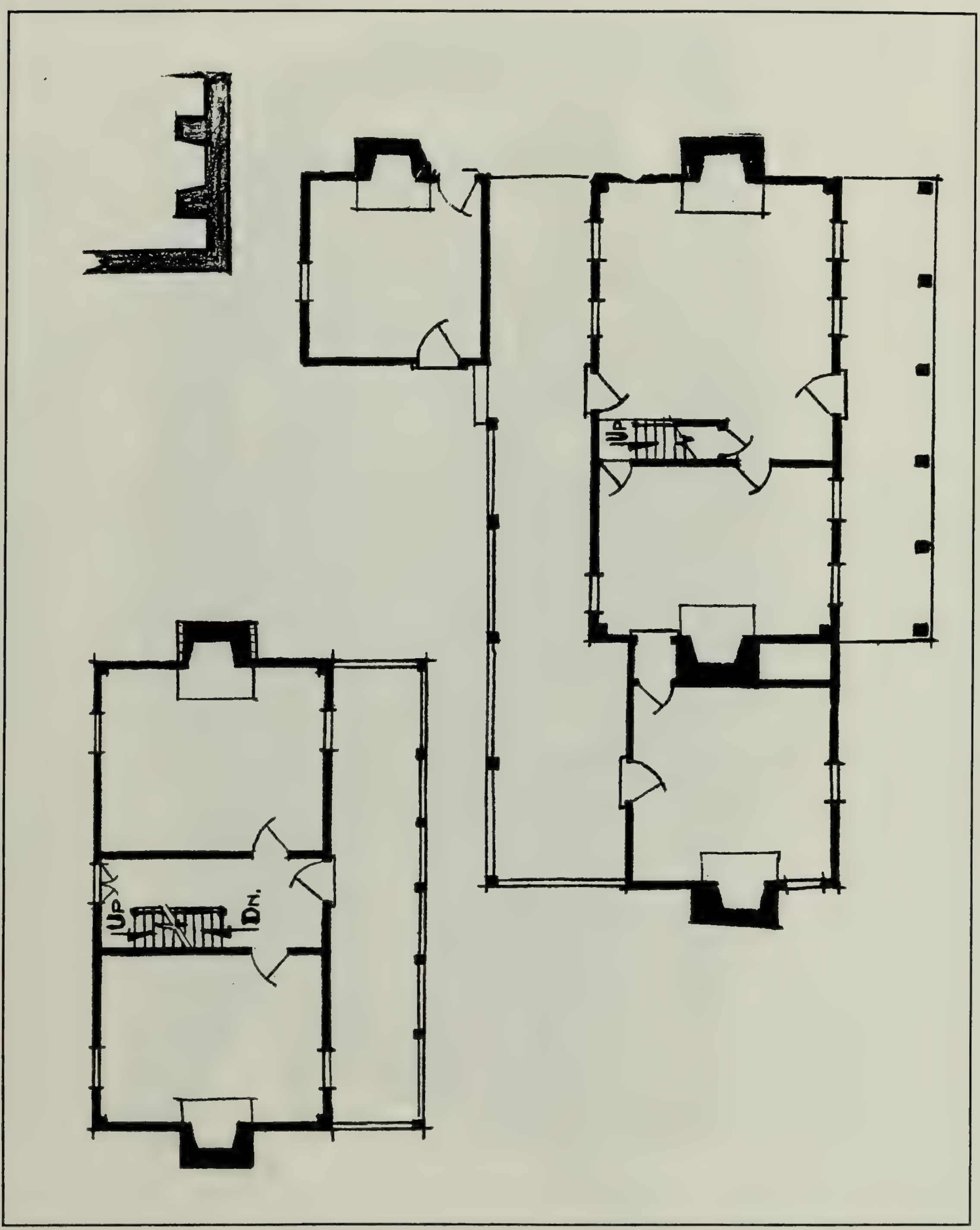
Presentation Design Sketches

A set of three stiff presentation drawing boards consisting of three floor plans and three exterior perspective and elevation renderings of the Main House and Stone Building were discovered in Wenzlick family collections toward the end of 1994. The drawings are presented on both sides of each 23 inch by 29 inch board and bear no title, date, or the artist's name. However, it is suspected that the drawings were completed by architect Paul Klingensmith for Delbert Wenlzick around just prior to or during 1940. The drawings depict alternative treatments for renovation of the Main House and Stone Building. One plan drawing of the Main House first floor may have been an existing condition drawing made prior to 1940 renovation work. The Stone Building design proposal board is very close to the restoration design now proposed for that building. Curiously, the drawing do not conform to any conventional architectural or engineering drawing scale.

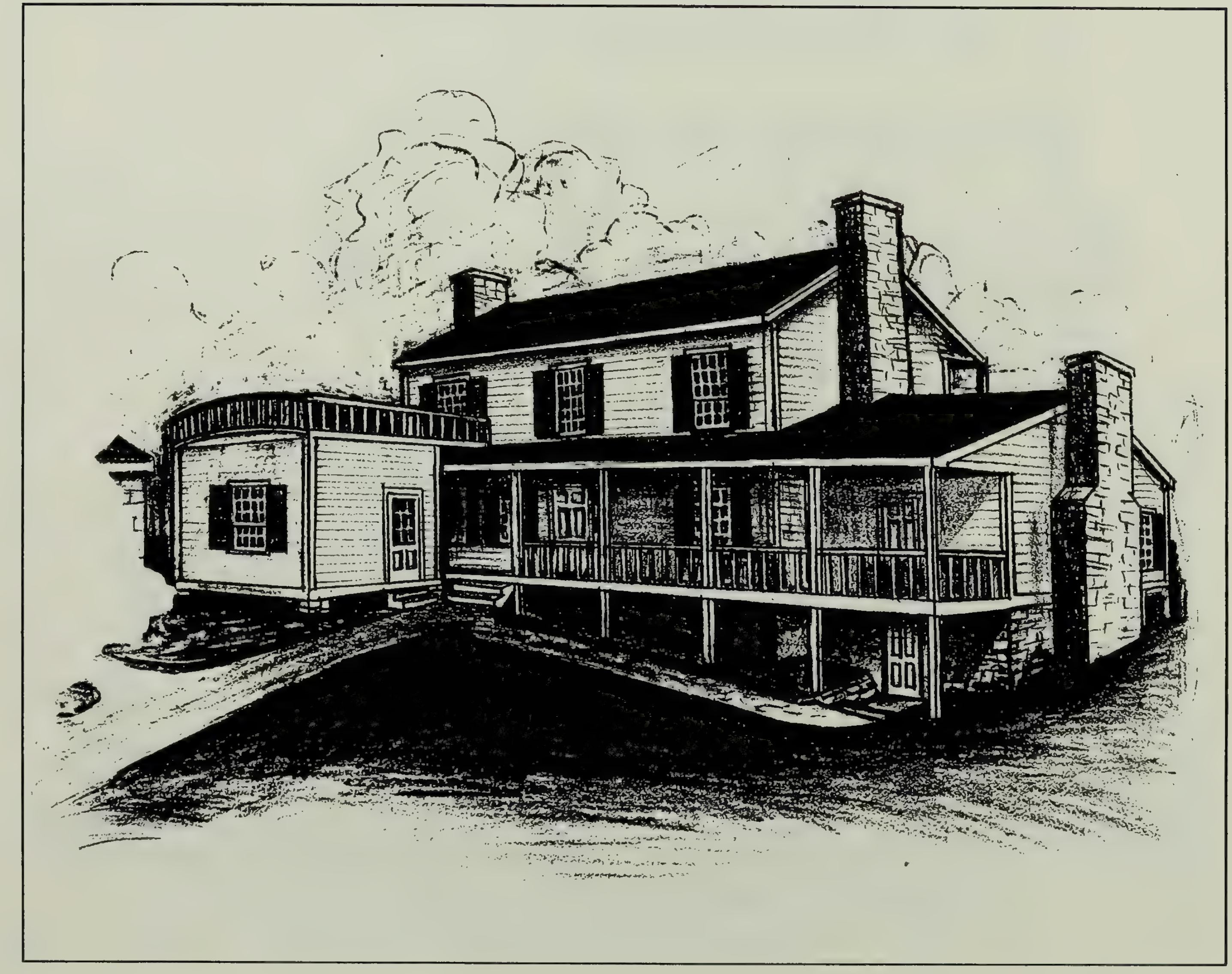
The original drawings are in the Wenzlick family collection. Photo copies of the drawings are in park collections.

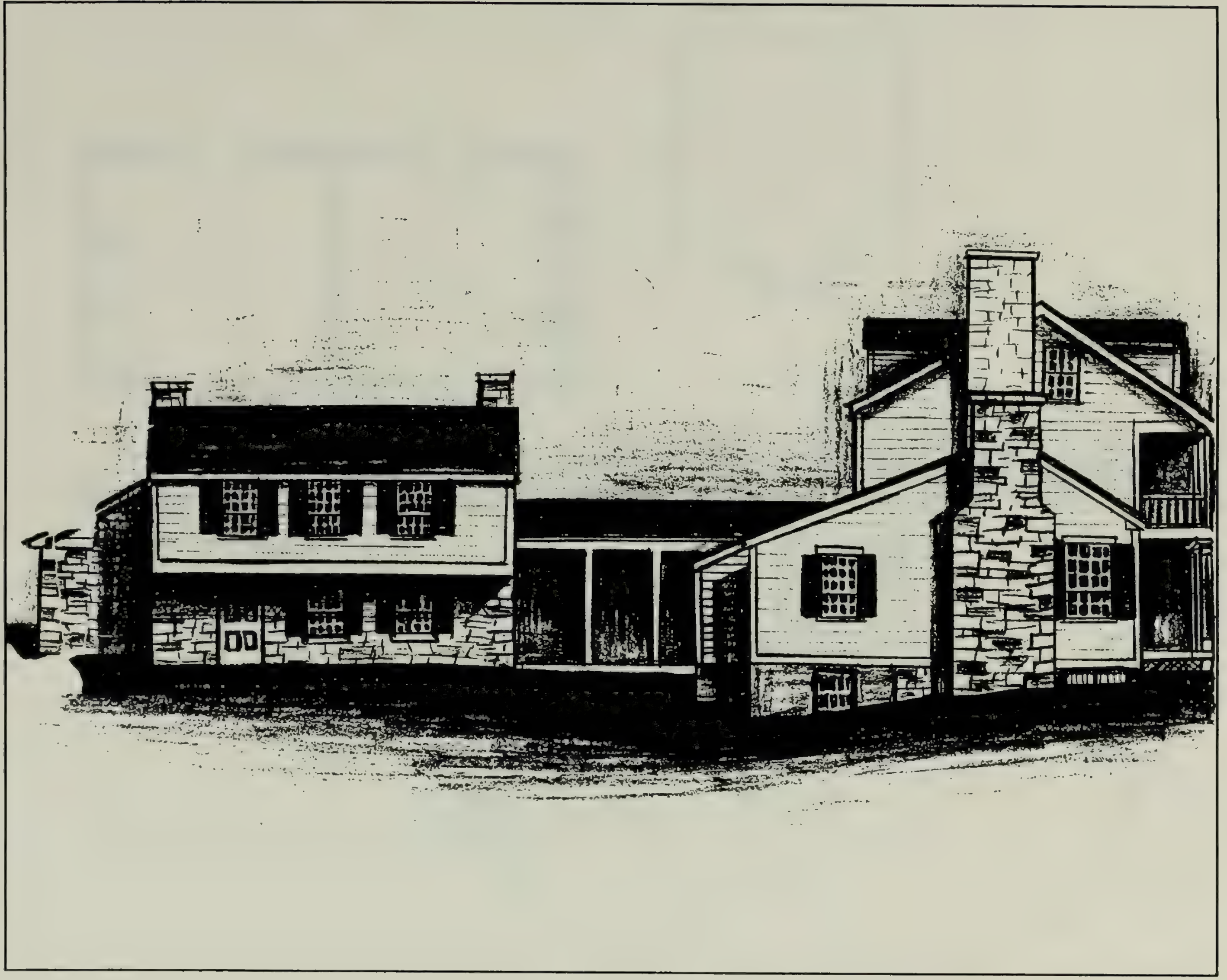


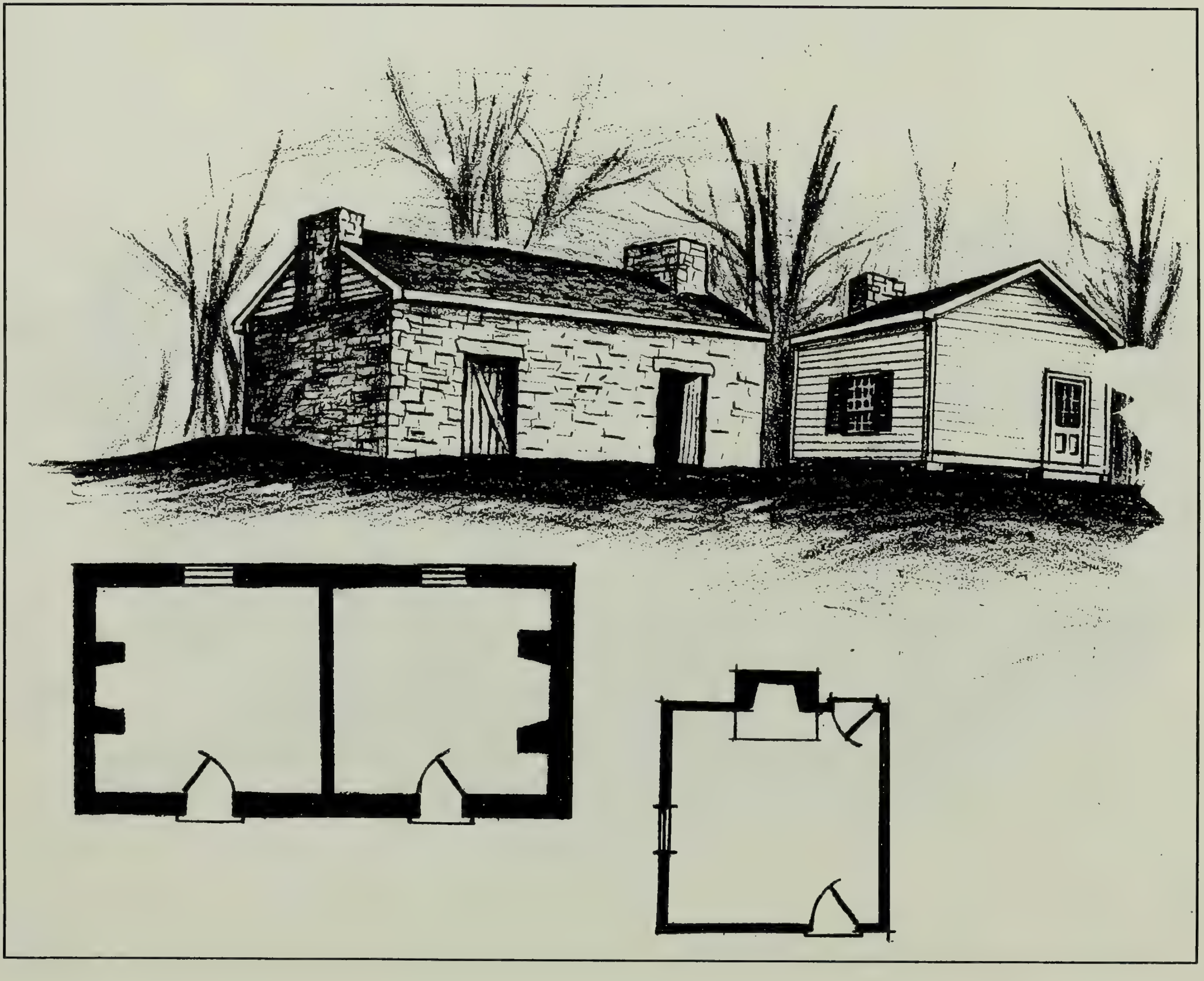



UP
UP
DN.

I.14

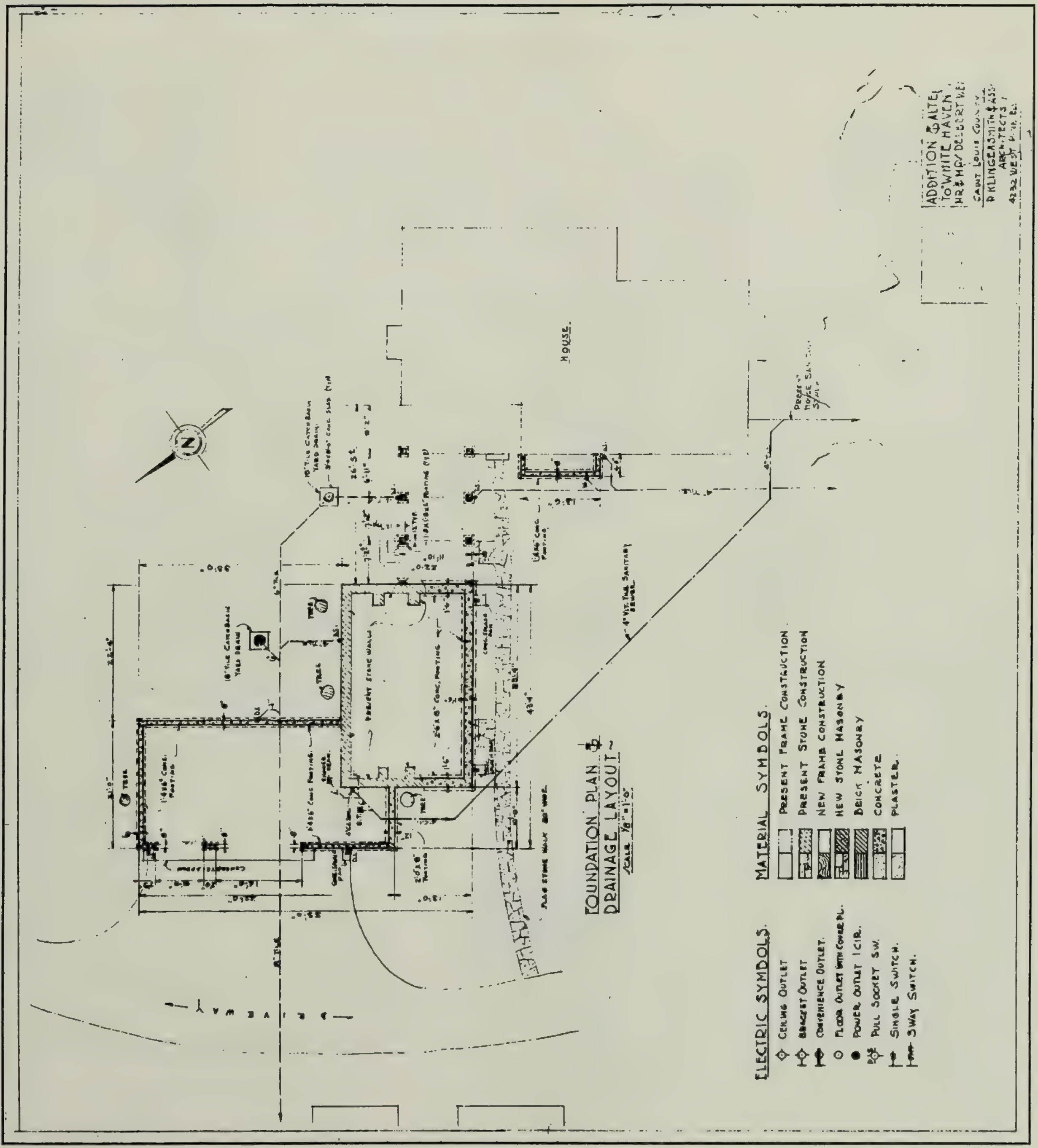


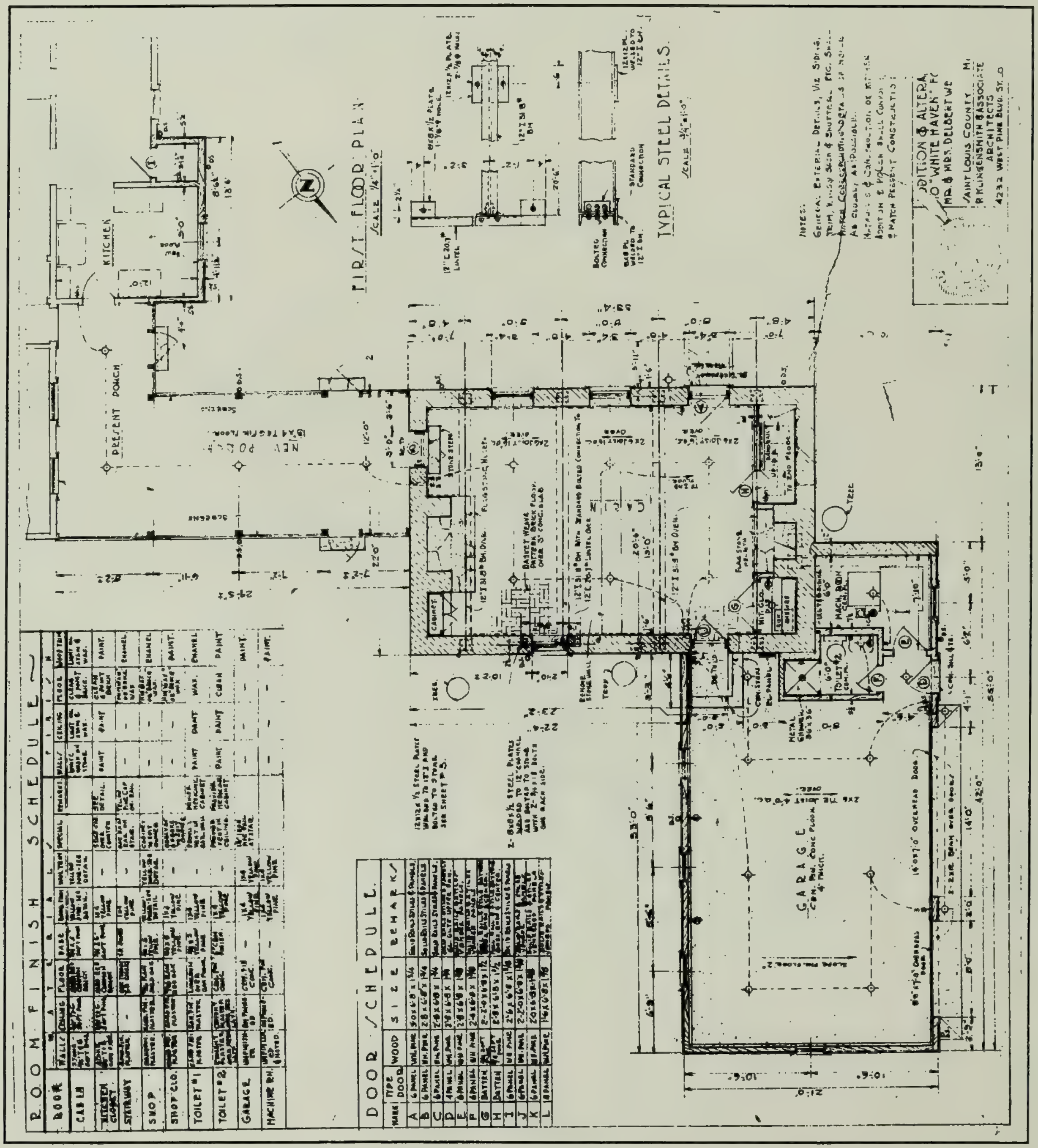


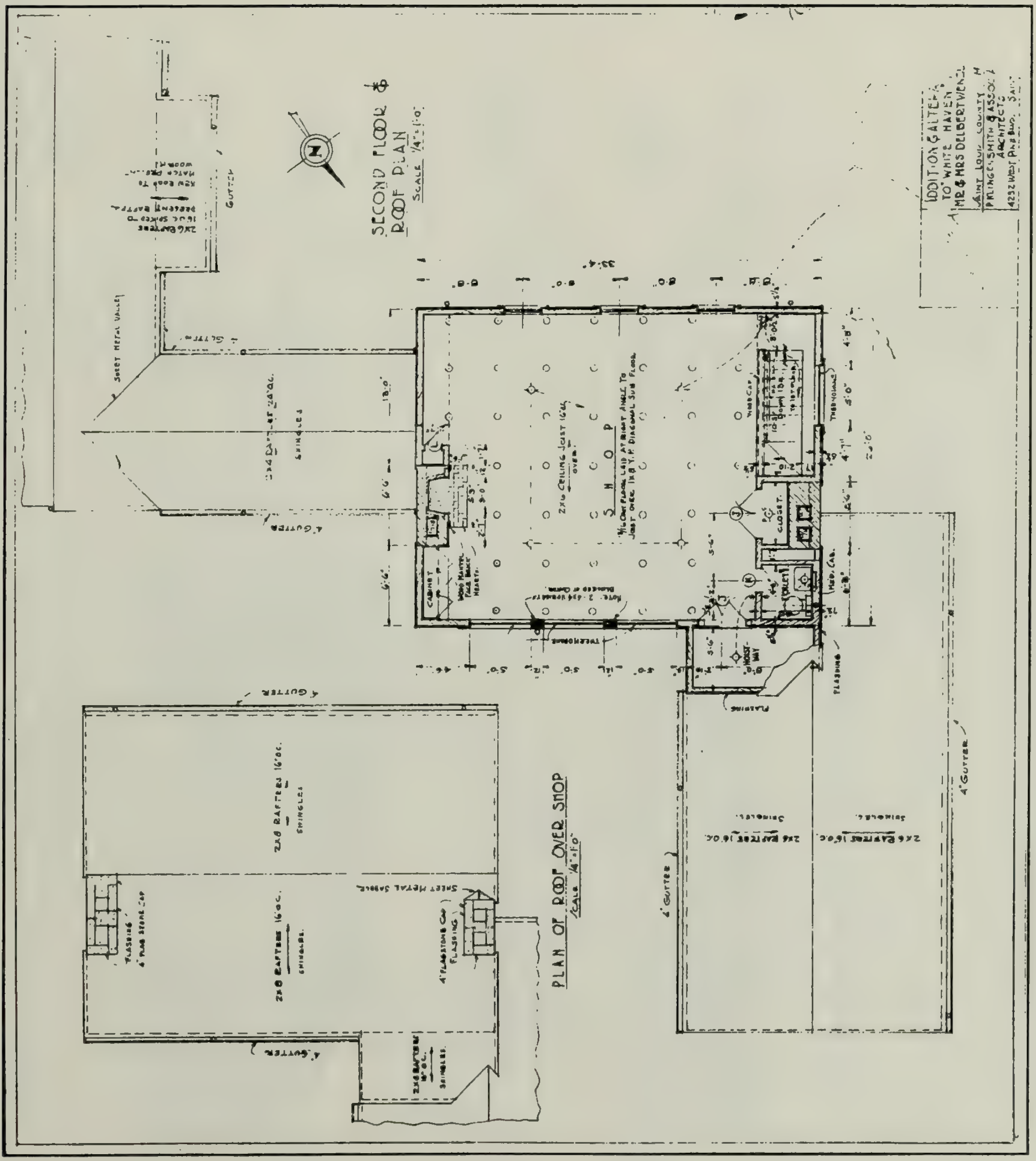


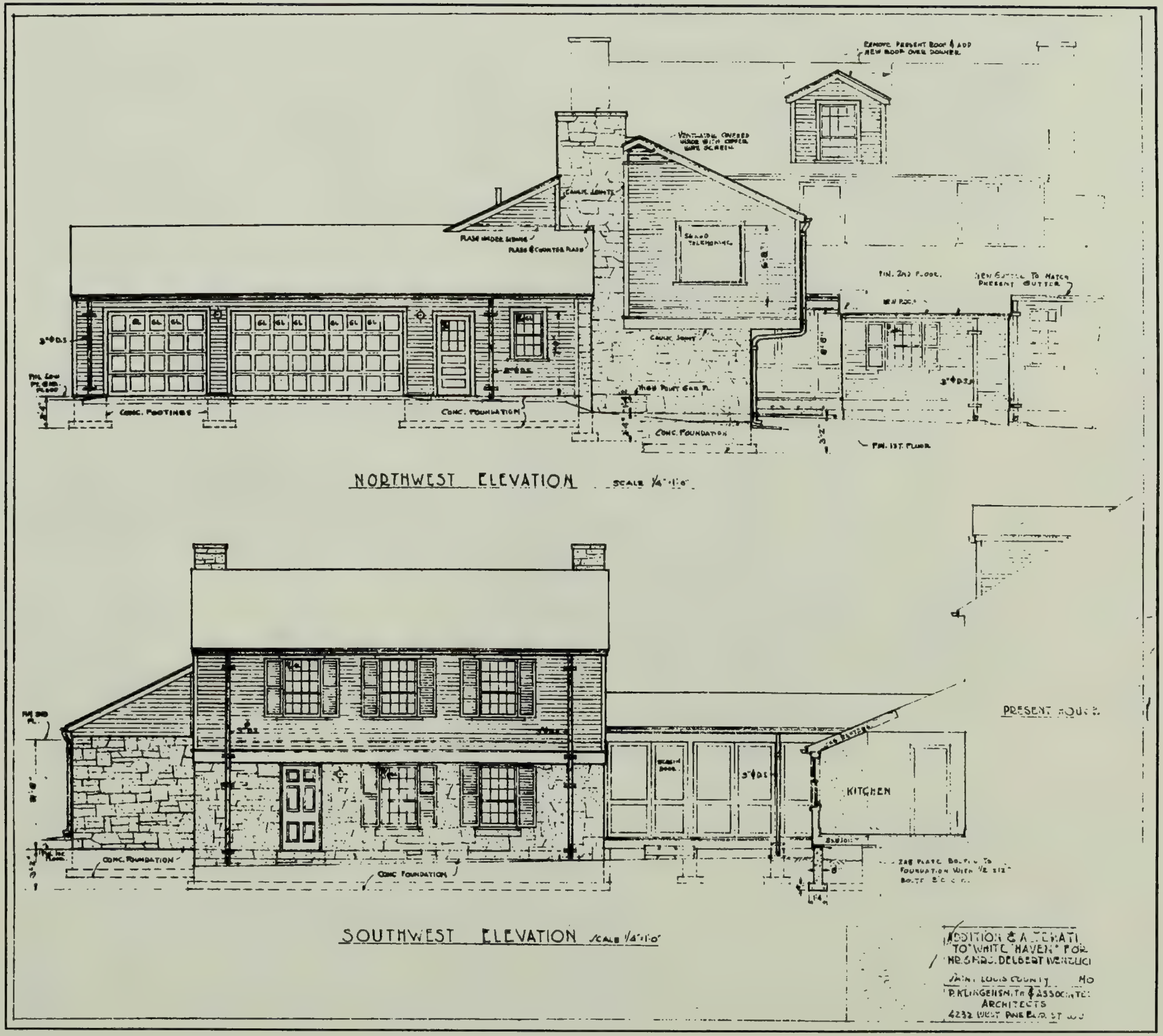
1940 Stone Building Renovation

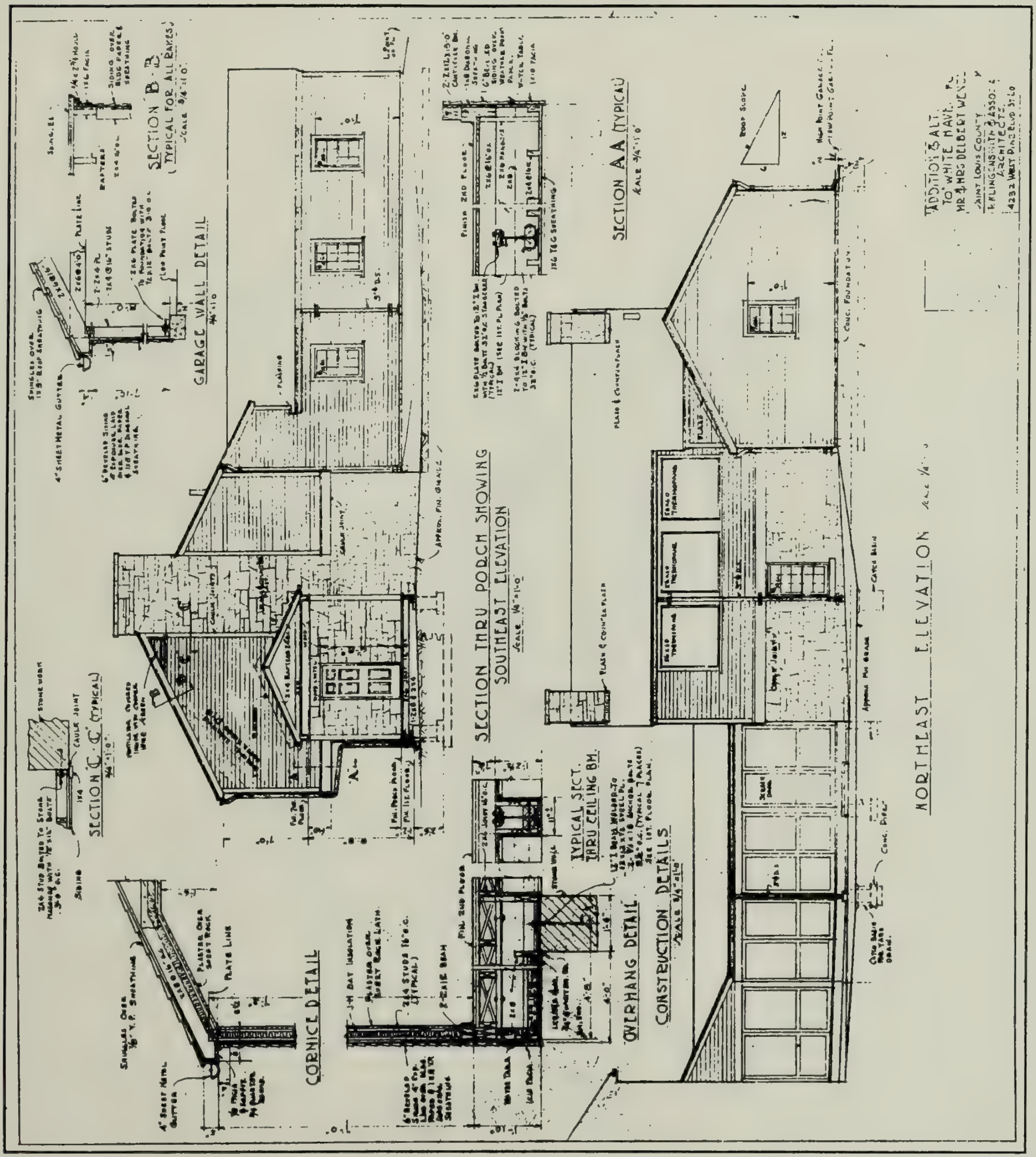
Delbert Wenzlick retained the services of St. Louis architect Paul Klingensmith to prepare construction drawings for the renovation of the Stone Building and addition of a three car garage. The five sheet set is believed to have been completed 1939 or 1940. Although the construction was never accomplished, the drawings reveal the extent of the original walls of the Stone Building. Original blueprint copies were donated to the park by Bill Wenzlick and are in the park collection.


FOUNDATION PLAN & DRAINAGE LAYOUT
SCALE 1/8"=1'-0"
HOUSE.
DRIVEWAY
N
PRESENT STONE WALL
TREE
FLAG STONE WALK
ADDITION & ALTER.
TO "WHITE HAVEN"
MR & MRS DELBERT WEB
SAINT LOUIS COUNTY
D. KLINGERSMITH & ASS.
ARCHITECTS
4232 WEST PINE BL.
ELECTRIC SYMBOLS.
CEILING OUTLET
BRACKET OUTLET
CONVENIENCE OUTLET.
FLOOR OUTLET WITH COVER PL.
POWER OUTLET 1 CIR.
PULL SOCKET SW.
SINGLE SWITCH.
3WAY SWITCH.
MATERIAL SYMBOLS.
PRESENT FRAME CONSTRUCTION.
PRESENT STONE CONSTRUCTION
NEW FRAME CONSTRUCTION
NEW STONE MASONRY
BRICK MASONRY
CONCRETE
PLASTER.


FIRST FLOOR PLAN
SCALE 1/4"=1'-0"
TYPICAL STEEL DETAILS
SCALE 3/4"=1'-0"
KITCHEN
PRESENT PORCH
NEW PORCH
SCREENS
CABIN
GARAGE
TOILET #2
MACH. ROOM
STONE STEPS
CABINET
TREE
TRAP
BOLTED CONNECTION
STANDARD CONNECTION
ROOM FINISH SCHEDULE
DOOR SCHEDULE
NOTES:
ADDITION & ALTERATION TO "WHITE HAVEN"
MR. & MRS. DELBERT WE
SAINT LOUIS COUNTY
R. KLINGENSMITH & ASSOCIATE ARCHITECTS
4232 WEST PINE BLVD. ST. LO

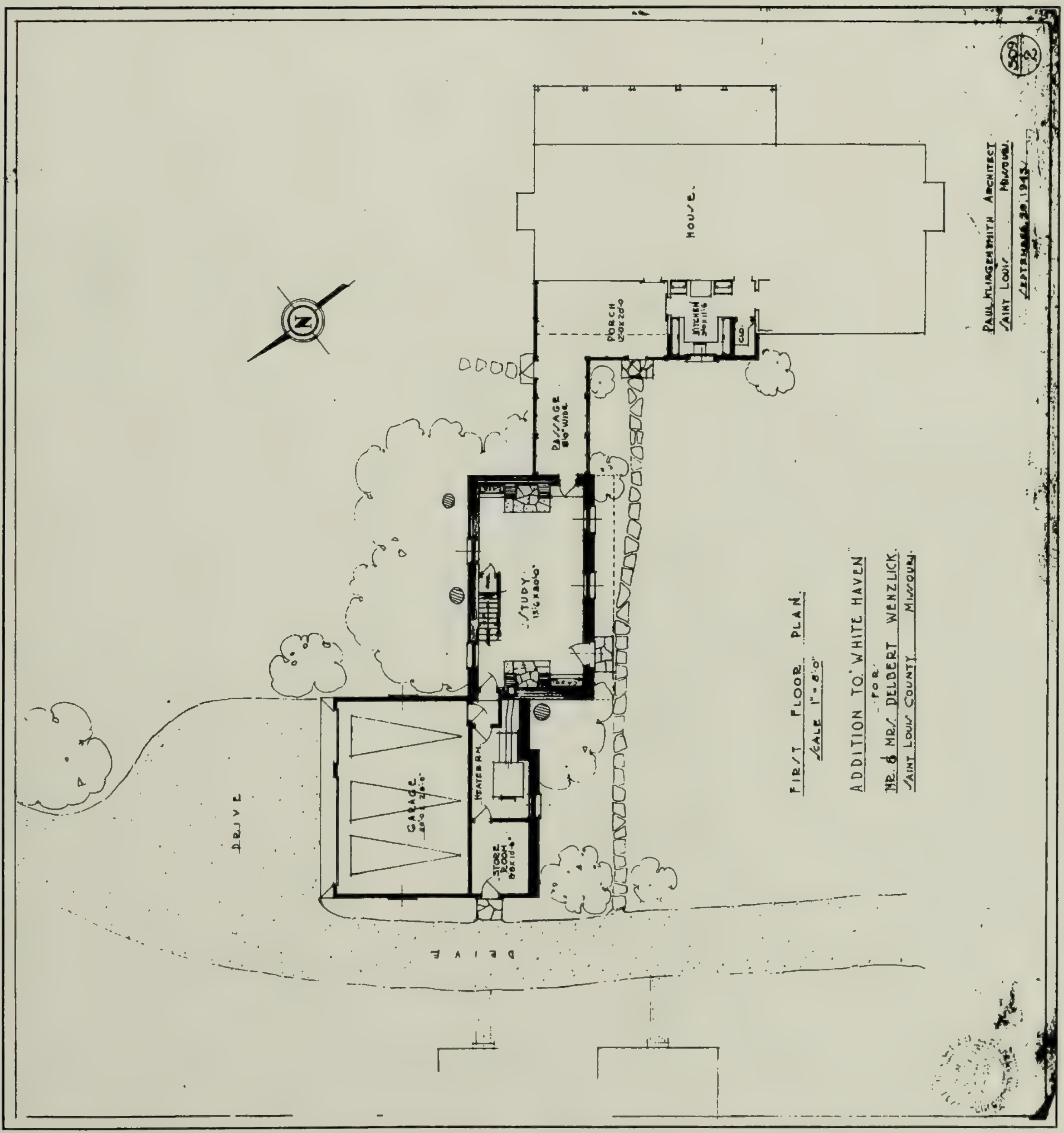

SECOND FLOOR & ROOF PLAN
SCALE 1/4" = 1'-0"
PLAN OF ROOF OVER SHOP
SCALE 1/4" = 1'-0"
SHOP
2x10 CEILING JOIST 16" O.C. OVER
CLOSET
TOILET
4" GUTTER
SHINGLES
2x8 RAFTERS 16" O.C.
2x6 RAFTERS 16" O.C.
SHEET METAL VALLEY
SHEET METAL SADDLE
FLASHING
33'-4"
ADDITION & ALTERATIONS
TO "WHITE HAVEN"
MR & MRS DELBERT WENZLICK
SAINT LOUIS COUNTY
PRINGLE, SMITH & ASSOC.
ARCHITECTS
4232 WEST PINE BLVD. SAINT LOUIS


REMOVE PRESENT ROOF & ADD NEW ROOF OVER DORMER
VENTILATING COVERED WITH COPPER WIRE SCREEN
CAULK JOINTS
FLASH UNDER SIDING
FLASH & COUNTER FLASH
SOUND TELEPHONIC
FIN. 2ND FLOOR
NEW GUTTER TO MATCH PRESENT GUTTER
NEW ROOF
CAULK JOINT
6'-8"
3'-0" D.S.
CONC. FOOTINGS
CONC. FOUNDATION
HIGH POINT GAR. FL.
FIN. 1ST FLOOR
NORTHWEST ELEVATION SCALE 1/4"=1'-0"
PRESENT HOUSE
KITCHEN
3'-0" D.S.
2x6 PLATE BOLTED TO FOUNDATION WITH 1/2 x 12" BOLTS 8' O.C.
CONC. FOUNDATION
SOUTHWEST ELEVATION SCALE 1/4"=1'-0"
ADDITION & ALTERATI
TO "WHITE HAVEN" FOR
MR. & MRS. DELBERT WENZLICK
SAINT LOUIS COUNTY MO
P. KLINGENSMITH & ASSOCIATES
ARCHITECTS
4232 WEST PINE BLVD. ST LOU


GARAGE WALL DETAIL
SECTION 'B' B
TYPICAL FOR ALL RAKES
SECTION AA (TYPICAL)
SECTION THRU PORCH SHOWING SOUTHEAST ELEVATION
SCALE 1/4"=1'0"
SECTION C-C (TYPICAL)
CORNICE DETAIL
OVERHANG DETAIL
CONSTRUCTION DETAILS
TYPICAL SECT. THRU CEILING BM.
NORTHEAST ELEVATION
ROOF SLOPE
CONC. FOUNDATION
ADDITION & ALT.
TO WHITE HAVE.
MR & MRS DELBERT WENZ
SAINT LOUIS COUNTY
KLINGENSMITH & ASSO. &
ARCHITECTS
4233 WEST PINE BLVD ST LO

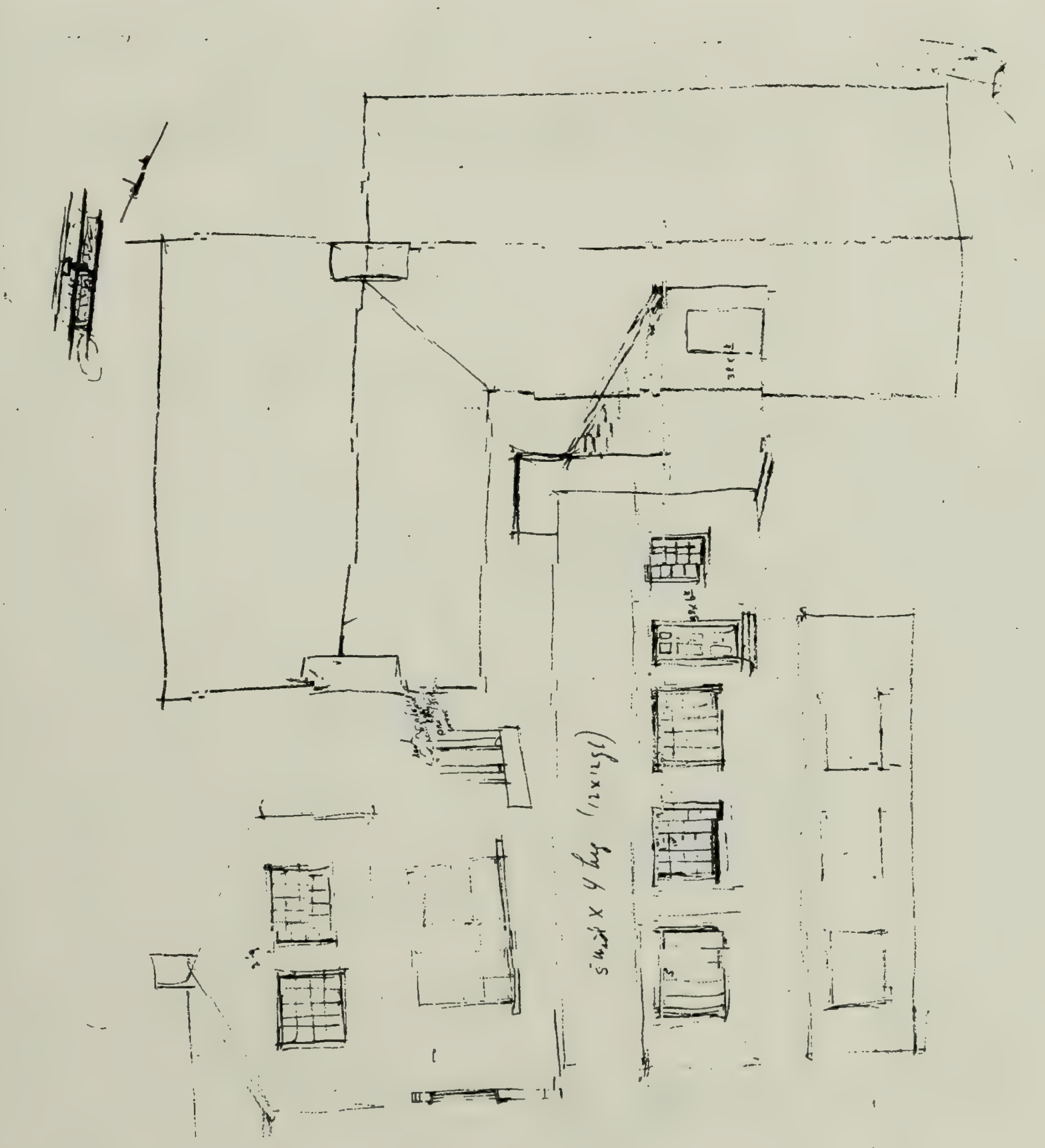
1945 Stone Building Renovation

A single design drawing was prepared for Delbert Wenzlick by Paul Klingensmith to convert the Stone Building into a study, add a three car garage to the north elevation of the Stone Building, and construct a kitchen in the house and a breezeway between the house and Stone Building. The drawing was completed on September 20, 1945 but the design was never carried out. The original drawing is in the park collection curtesy of Bill Wenzlick.


FIRST FLOOR PLAN.
SCALE 1" = 8'0"
ADDITION TO "WHITE HAVEN"
FOR
MR. & MRS. DELBERT WENZLICK.
SAINT LOUIS COUNTY MISSOURI.
PAUL KLINGENSMITH ARCHITECT
SAINT LOUIS MISSOURI.
SEPTEMBER 20, 1945.
309
2
HOUSE.
PORCH 12'0"x20'0"
KITCHEN
CLO.
PASSAGE 8'0" WIDE
STUDY 15'6"x20'0"
HEATER RM.
STORE ROOM
GARAGE
DRIVE
DRIVE
N

Workshop Sketch Drawing

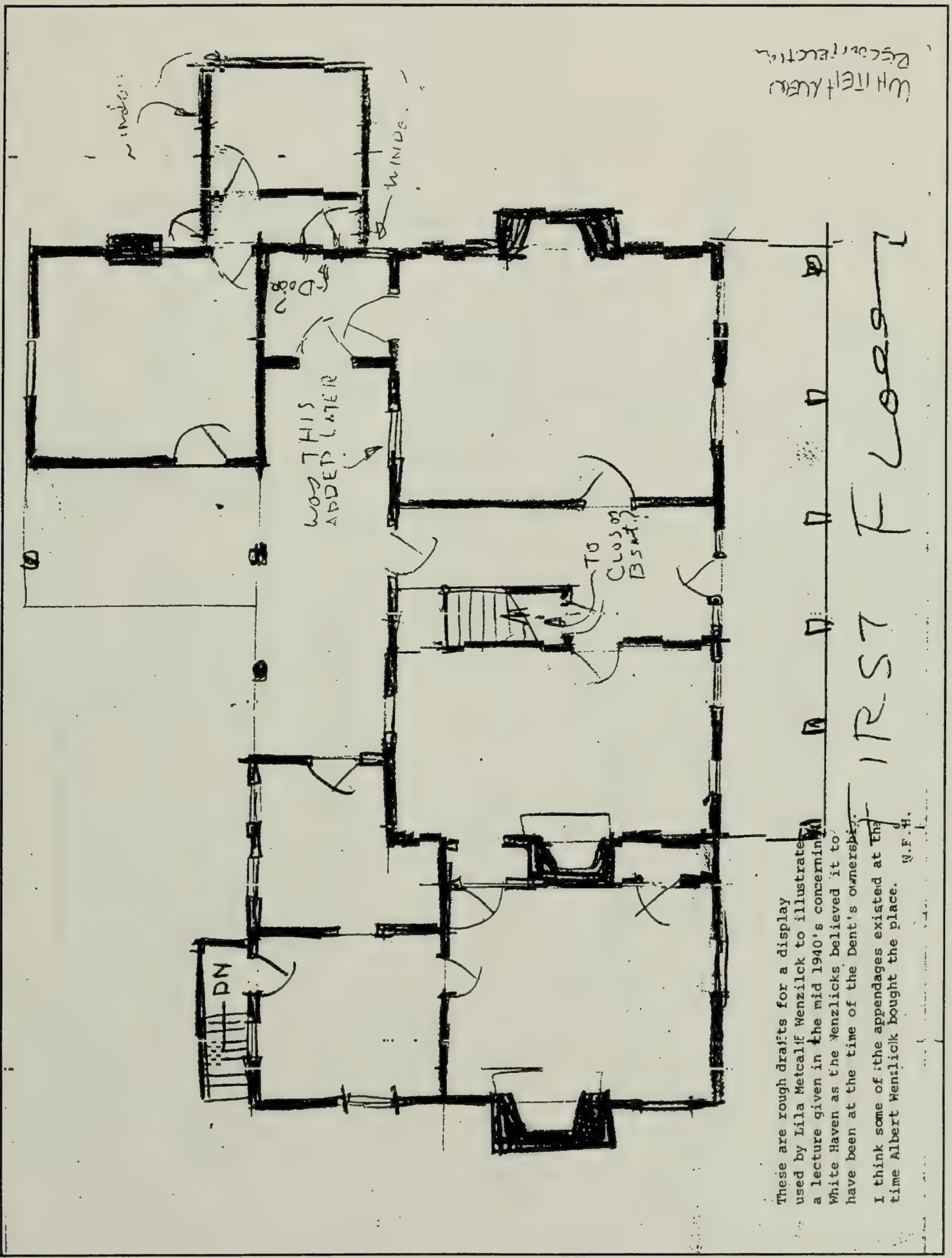
A pencil drawing on white trace paper in sketch form shows the workshop and a portion of the Stone Building in plan and elevation as it exists today. The date of the drawing is unknown but it is believed to have been completed around 1948. The preparer of the drawing is unknown. The original drawing is in the park collection curtesy of Bill Wenzlick.


5 wide x 4 hig (12x12 gl)

Lila Metcalf Wenzlick Drawings

The first sketch on the facing page was apparently prepared by Lila Metcalf Wenzlick in the mid-1940s as a rough draft for a lecture display, according to a type-written note on the sheet. The first floor plan closely follows the layout presented in the 1940 HABS drawings. A copy of this drawing was presented to the park courtisy of Bill Hayes.

The second drawing is similar to the first, although the former contains more notations. The drawing is representative of the conditions of the house prior to 1940 renovation work. The drawing was included in a March 27, 1992 letter from Marjorie Felice to park historian Kimberly Little. The original letter is in park collections and a copy of the original drawing is in the collection of Bill Hayes.


WHITEHAVEN
Resurrection
window
WINDOW
Door?
WAS THIS ADDED LATER
TO CLOSET? BSMT?
DN
FIRST FLOOR

These are rough drafts for a display used by Lila Metcalf Wenzilck to illustrate a lecture given in the mid 1940's concerning White Haven as the Wenzlicks believed it to have been at the time of the Dent's ownership.

I think some of the appendages existed at the time Albert Wenzlick bought the place.

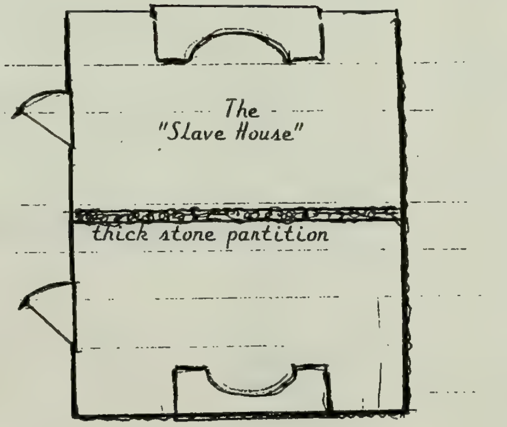
W.F.H.

Albert Wenzlick acquired White Haven in 1913 and owned it until his death in 1937. He put the dormers in the attic.

The first floor and the "Slave House" are shown here in a sketch (not drawn to scale) as remembered by Albert Wenzlick's granddaughter, Marjorie Abbott Felice, from her 17 years of living there. (To 1937)

The second floor was altered by Albert Wenzlick by taking part of one bedroom and creating a long bathroom opening off the hall. Delbert Wenzlick partitioned this in half, and put an opening from the rear half into the bedroom.

The upstairs front porch was screened, providing a sewing area for Mrs. Wenzlick and daughter and granddaughters.

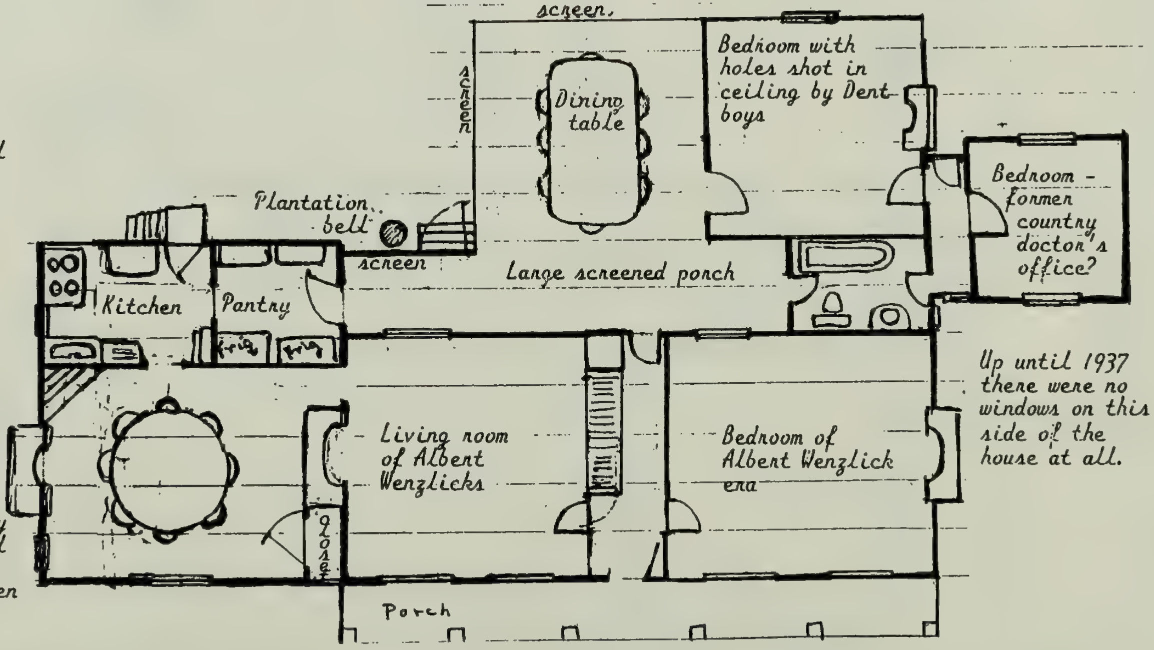

The "Slave House"
thick stone partition

Delbert Wenzlick described this as a "lean-to" kitchen.

Since this dining room built over the original cabin is higher than the rest of the first floor, there was a big step down into the kitchen, wide, wooden and worn to a hollow in the middle.

The diagonal lines represent a floor-to-ceiling cupboard with hutch above built by Mrs. Albert Wenzlick!

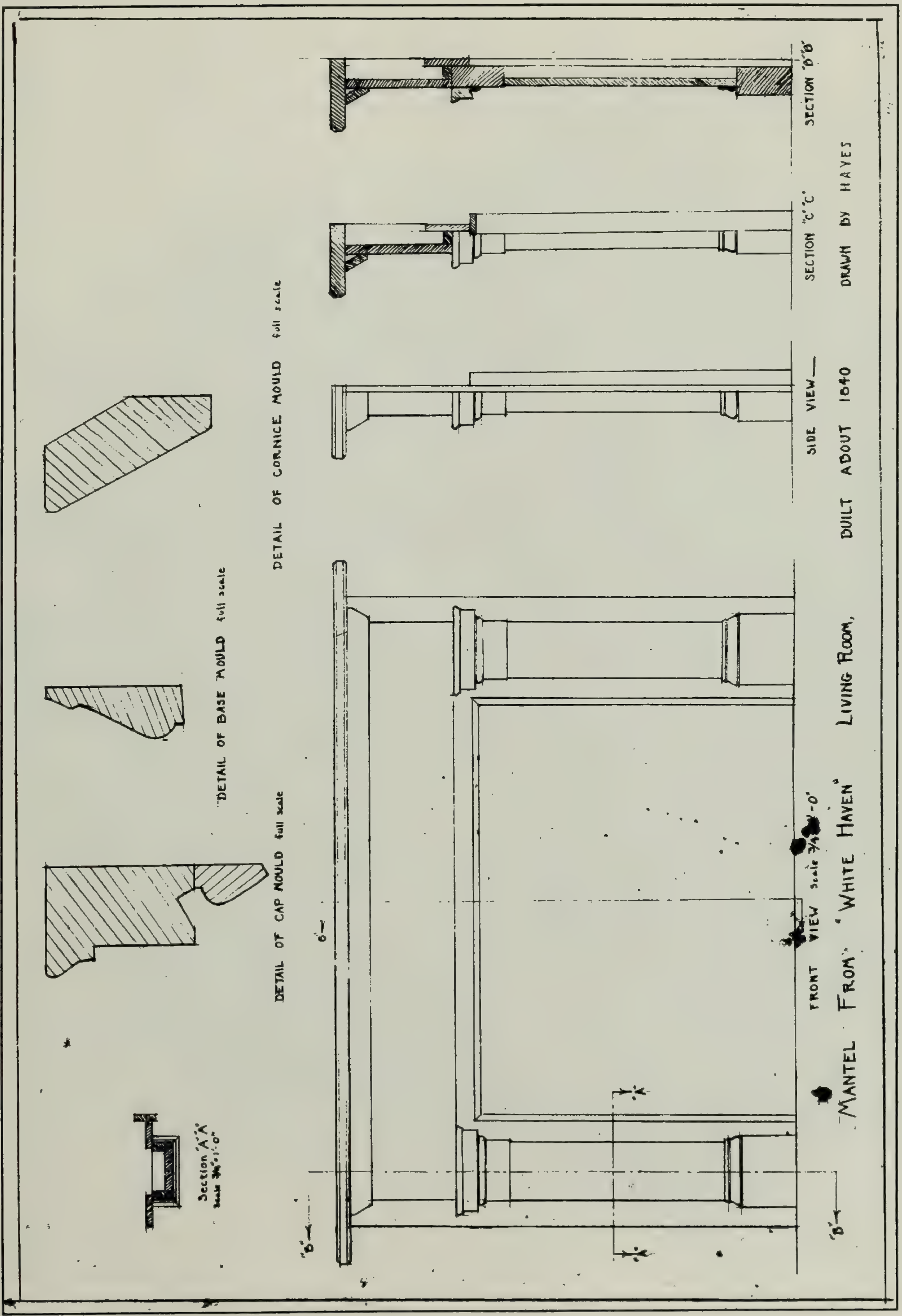
Since the Wenzlicks moved out from the city in May and stayed until mid-October, this room was used for dining when the weather was cool.


screen
screen
Dining table
Bedroom with holes shot in ceiling by Dent boys
Bedroom - former country doctor's office?
Plantation bell
screen
Large screened porch
Kitchen
Pantry
frig
frig
Living room of Albert Wenzlicks
Bedroom of Albert Wenzlick era
closet
Porch

Up until 1937 there were no windows on this side of the house at all.

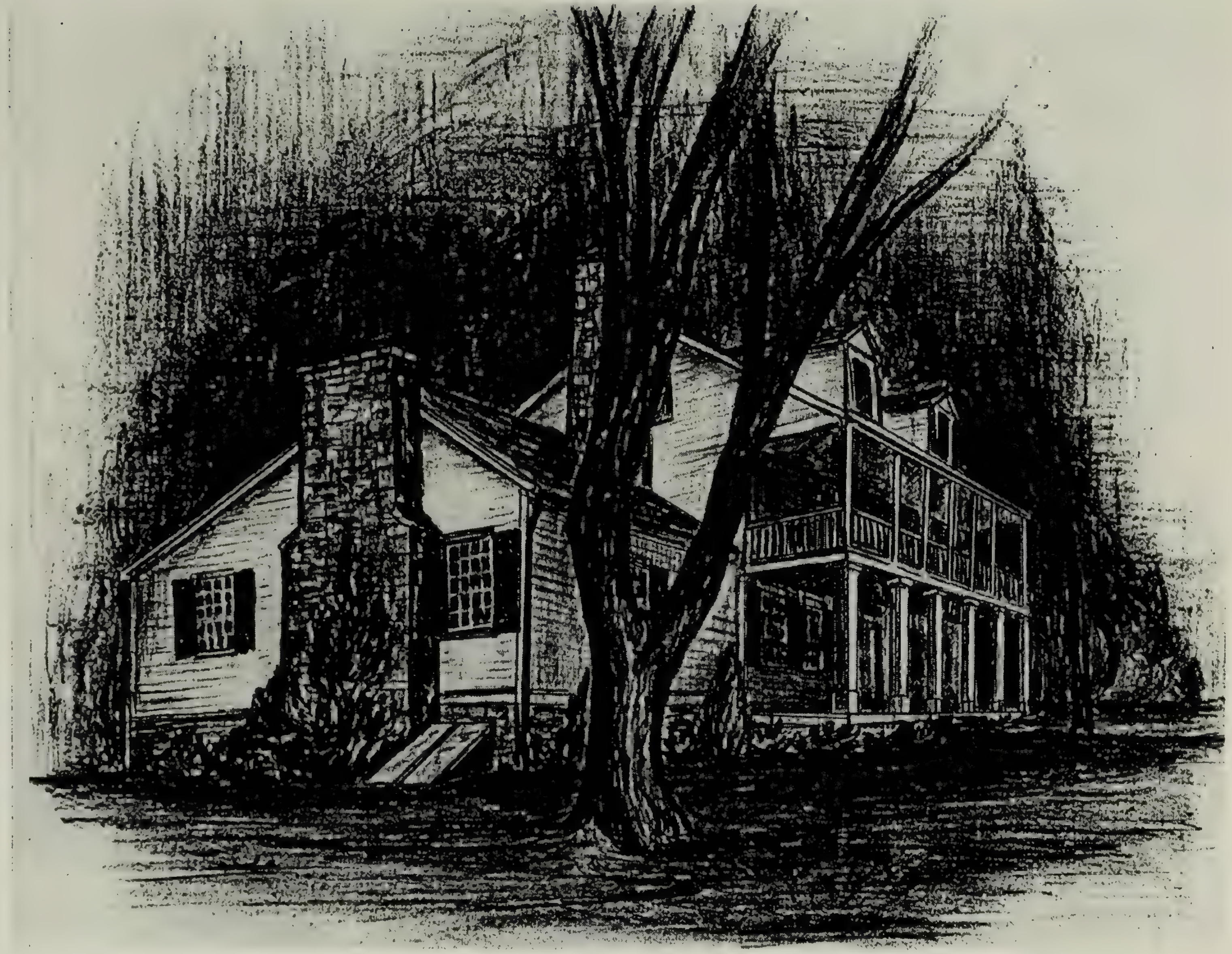
Living Room Chimney Piece

Bill Hayes prepared a measured drawing of the Greek Revival chimney piece which was situated in the Living Room (101) of the house prior to its removal in 1940. The chimney piece was stored in a barn until removed by Hayes's father in 1947; the wood content possibly used in projects away from the site. The original scaled drawing was prepared as a school project and graciously donated to the park by Hayes.


Section 'A' 'A'
Scale 3/4"=1'-0"
DETAIL OF CAP MOULD full scale
DETAIL OF BASE MOULD full scale
DETAIL OF CORNICE MOULD full scale
"B"
"B"
FRONT VIEW scale 3/4"=1'-0"
SIDE VIEW
SECTION "C" "C"
SECTION "B" "B"
MANTEL FROM "WHITE HAVEN" LIVING ROOM, BUILT ABOUT 1840
DRAWN BY HAYES

Pencil Rendering

An untitled undated pencil rendering was donated to the park by Bill Wenzlick. The view is of the south and west faces of the house from the southwest after 1940 renovation work. The artist is unknown. The original drawing was donated to the park by Bill Wenzlick and is in park collections.



1991 HABS Documentation

A five-person Historic American Building Survey team returned to the site during summer 1991 under sponsorship of the National Park Service. The purpose of this visit was to provide accurate documentation of existing conditions including floor plans, exterior elevations, and building sections (see 1991 HABS Drawings) for all extant structures.[1] The HABS team completed drawings for all buildings except the Ice House due to time constraints. The Ice House sheet was completed in 1992 to HABS drafting standards by Historical NPS Architect Laura Johnson. Original drawings are in the Library of Congress, HABS collections (MO-1150 ADDENDUM). Copies of drawings and field notes are in park collections. No large-format photographs were taken.

All of the following sheets, except for the Ice House, are reductions of drawing produced by HABS immediately after their completion during Summer 1991. Two years later two additional drawing sheets were added by HABS showing the Main House and Stone Building first and second floor levels at ⅛ inch scale. These two drawings are not been included in the following set. All drawing sheets, except the cover page and the two ⅛ inch scale plan sheets, were scanned and vectorized to AutoCAD.

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[1] Although these drawings are far more detailed than the 1940 HABS drawings, substantial errors were detected after the final drawings were completed. The errors are concentrated around the West Wing which is depicted as out of square with respect to the main two story portion of the house in the basement and first floor plans, and the west exterior elevation. In fact the west wing space is square and its south elevation nearly flush with that of the two story portion of the house. Other minor dimensional errors were found throughout the final drawings and field notes during later use of the drawings. A majority of the errors were corrected during the subsequent generation of preliminary design and structural drawings.

WHITE HAVEN
1991 HABS DRAWINGS
ULYSSES S. GRANT NATIONAL HISTORIC SITE
ST. LOUIS COUNTY, MISSOURI

LIST OF DRAWINGS

MAIN HOUSE AND STONE BUILDING (HS-1 AND HS-2)

0. TITLE SHEET
1. MAIN HOUSE PERSPECTIVE (NOT INCLUDED)
2. MAIN HOUSE BASEMENT FLOOR PLAN
3. MAIN HOUSE, STONE BLDG, WORKSHOP FIRST FLOOR PLAN (NOT INCLUDED)
4. MAIN HOUSE FIRST FLOOR PLAN
5. STONE BUILDING (HS-2)/WORKSHOP FIRST FLOOR PLAN
6. MAIN HOUSE, STONE BLDG., WORKSHOP SECOND FLOOR PLAN (NOT INCLUDED)
7. MAIN HOUSE SECOND FLOOR PLAN
8. STONE BUILDING (HS-2)/WORKSHOP SECOND FLOOR PLAN
9. MAIN HOUSE ATTIC PLAN
10. MAIN HOUSE SOUTHEAST ELEVATION
11. MAIN HOUSE SOUTHWEST ELEVATION
12. MAIN HOUSE NORTHWEST ELEVATION
13. MAIN HOUSE NORTHWEST ELEVATION
14. MAIN HOUSE NORTHEAST ELEVATION
15. MAIN HOUSE TRANSVERSE AND LONGITUDINAL SECTIONS

BARN (HS-3)

1. BARN FIRST FLOOR PLAN
2. BARN LOFT PLAN
3. BARN NORTHEAST ELEVATION
4. BARN SOUTHEAST AND NORTHWEST ELEVATIONS
5. SOUTHWEST ELEVATION
6. LONGITUDINAL SECTION
7. AXONOMETRIC OF ONE BRACE BENT AND TRANSVERSE SECTION

ICEHOUSE (HS-4)

1. FLOOR PLANS, ELEVATIONS AND LONGITUDINAL SECTION

CHICKEN HOUSE (HS-5)

1. FLOOR PLAN AND ELEVATIONS

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

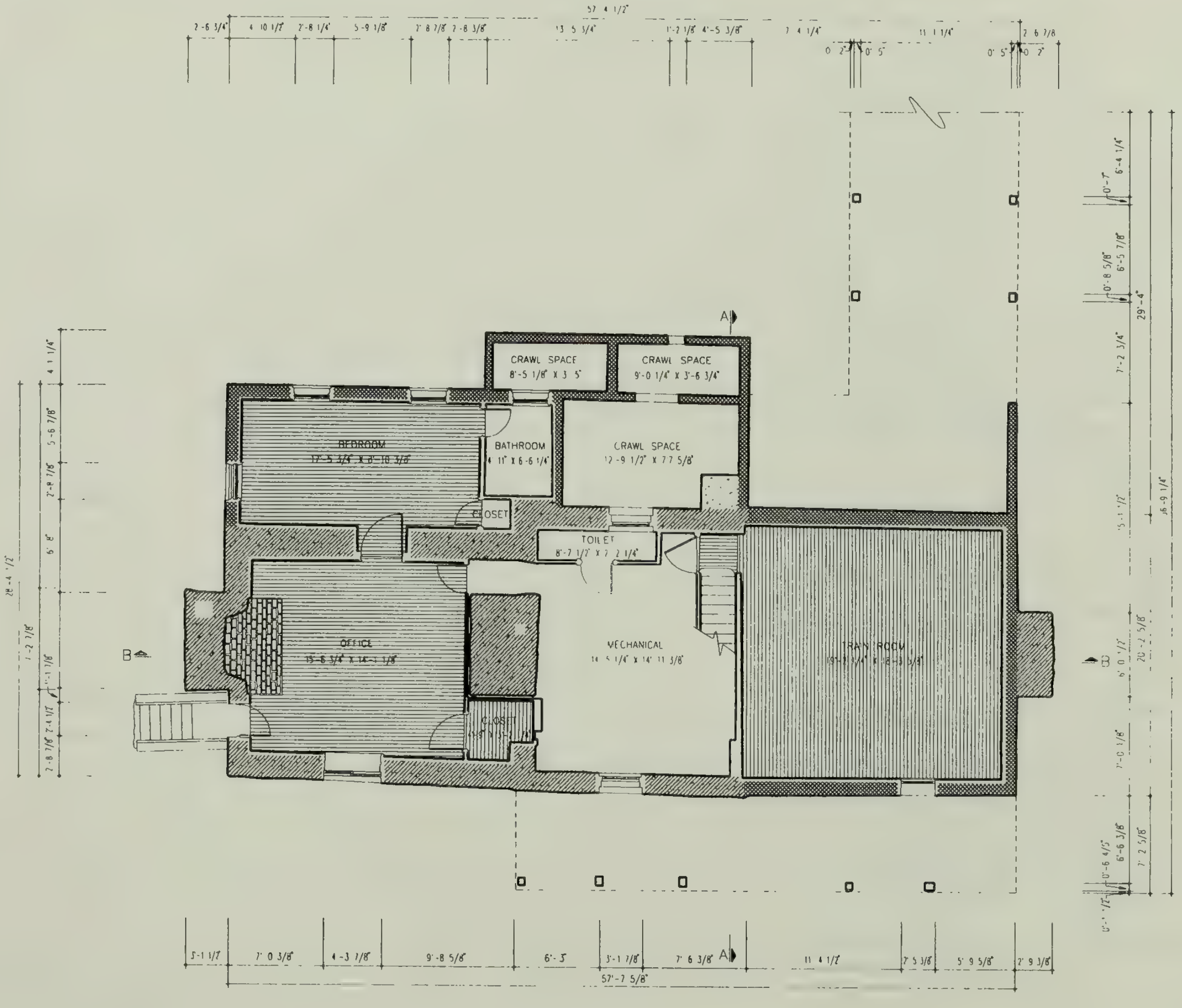
MISSOURI

SURVEY NO.
MO-1150
ADDENDUM

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 0 OF 15 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

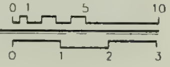
DRAWING SCANNED AND MICROFILMED BY MANZER, SANCHEZ & ASSOCIATES, ST. LOUIS, MO (314)-567-7999


CRAWL SPACE
8'-5 1/8" X 3' 5"
CRAWL SPACE
9'-0 1/4" X 3'-6 3/4"
BEDROOM
17'-5 3/4" X 8'-10 3/8"
BATHROOM
4' 11" X 6'-6 1/4"
CRAWL SPACE
12'-9 1/2" X 7'7 5/8"
CLOSET
TOILET
8'-7 1/2" X 7' 2 1/4"
OFFICE
15'-8 3/4" X 14'-1 1/8"
MECHANICAL
14'-5 1/4" X 14' 11 3/8"
CLOSET
TRAIN ROOM
A
B
57'-4 1/2"
2'-6 3/4"
4'-10 1/2"
2'-8 1/4"
5'-9 1/8"
2'-8 7/8"
2'-8 3/8"
13'-5 3/4"
1'-2 1/8"
4'-5 3/8"
7'-4 1/4"
11'-1 1/4"
2'-6 7/8"
0' 2"
0' 5"
5'-1 1/2"
7'-0 3/8"
4'-3 7/8"
9'-8 5/8"
6'-5"
5'-1 7/8"
7'-6 3/8"
11'-4 1/2"
7'-5 3/8"
5'-9 5/8"
2'-9 3/8"
57'-7 5/8"
6'-4 1/4"
0'-7"
0'-8 5/8"
6'-5 7/8"
29'-4"
7'-2 3/4"
5'-1 1/2"
36'-9 1/4"
6'-0 1/2"
20'-2 5/8"
7'-0 1/8"
6'-6 3/8"
0'-6 4/5"
7'-2 5/8"
4'-1 1/4"
5'-6 7/8"
2'-8 7/8"
6'-8"
28'-4 1/2"
1'-2 7/8"
1'-1 7/8"
2'-4 1/2"
2'-8 7/8"

BASEMENT PLAN

FEET 1/4" = 1'-0"

METERS 1:48



MATERIALS
- WALLS —— STONE, PLASTER ON STONE, PLASTER ON LATH PINE PANELING, GYPSUM BOARD
- FLOORING —— PINE, CONCRETE, CERAMIC TILE
- CEILING —— PLASTER ON LATH, GYPSUM BOARD, EXPOSED WALNUT BEAMS AND FLOOR DECKING

DRAWN BY STEVEN C. BYINGTON

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

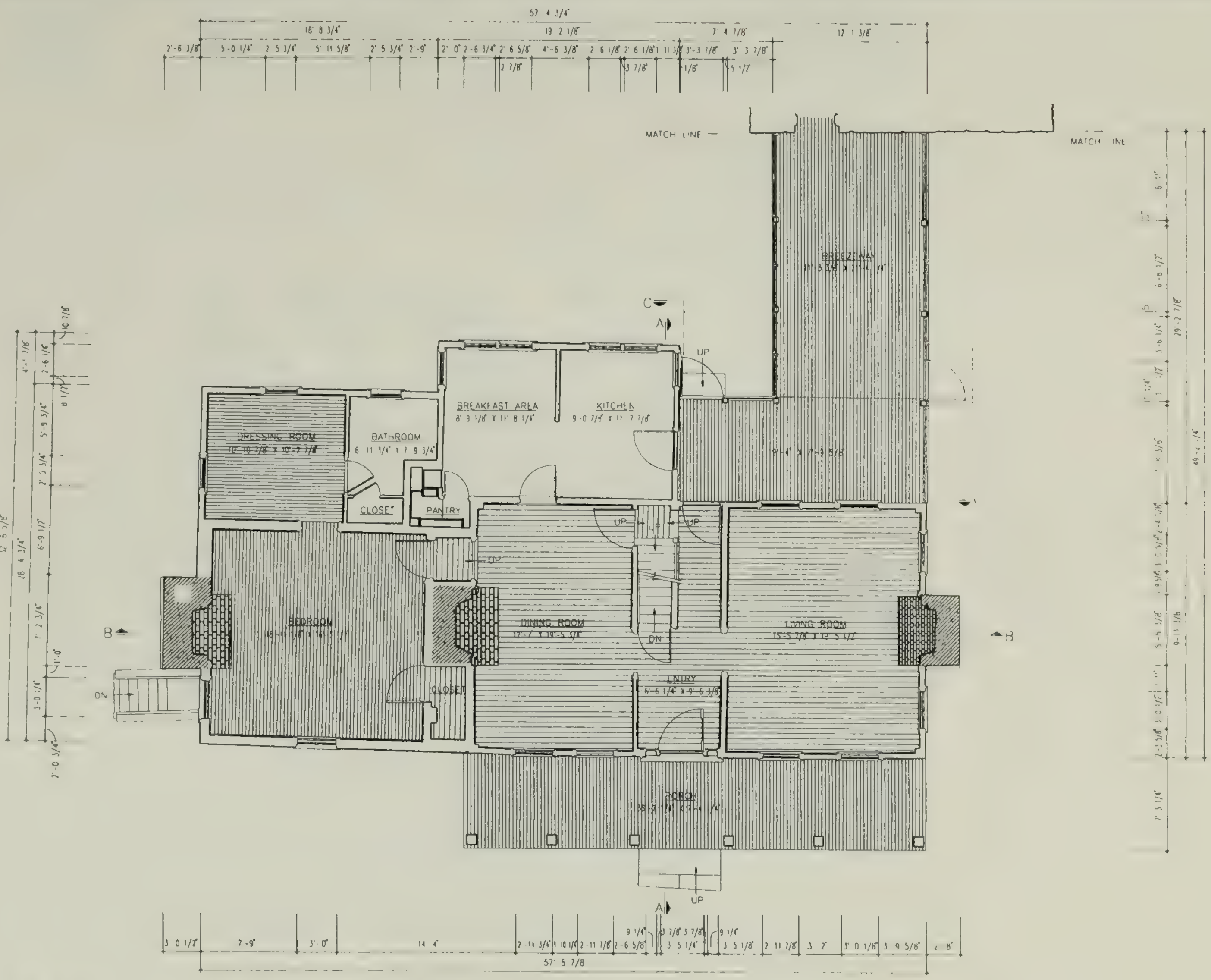
MISSOURI

SURVEY NO.
MO-1150
ADDENDUM

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 2 OF 15 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

DRAWING SCANNED AND VECTORIZED BY MANZER, SANCHEZ & ASSOCIATES, ST. LOUIS, MO (314)-567-7999


57' 4 3/4"
18' 8 3/4"
19' 2 1/8"
7' 4 7/8"
12' 1 3/8"
MATCH LINE
MATCH LINE
BREEZEWAY
DRESSING ROOM
10'-10 7/8" x 10'-2 7/8"
BATHROOM
6' 11 1/4" x 7' 9 3/4"
BREAKFAST AREA
8' 3 1/8" x 11' 8 1/4"
KITCHEN
9'-0 7/8" x 11' 7 7/8"
8'-4" x 7'-3 5/8"
CLOSET
PANTRY
UP
UP
UP
UP
DN
DN
BEDROOM
DINING ROOM
LIVING ROOM
15'-5 7/8" x 19' 5 1/2"
ENTRY
6'-6 1/4" x 9'-6 3/8"
CLOSET
PORCH
A
A
B
B
C
12' 6 5/8"
28' 4 3/4"
29'-2 7/8"
49'-4 1/4"
9'-11 7/8"
57' 5 7/8"
3' 0 1/2"
7'-9"
3'-0"
14' 4"

FIRST FLOOR PLAN

FEET 1/4" = 1'-0"
METERS 1:48

MATERIALS
WALLS ——— PLASTER ON WOOD LATH, PLASTER ON METAL LATH
FLOORING — PINE, VINYL, CERAMIC TILE
CEILING — PLASTER ON WOOD LATH, PLASTER ON METAL LATH, FIR DECKING

DRAWN BY: MANUEL E. SKOW

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

MISSOURI

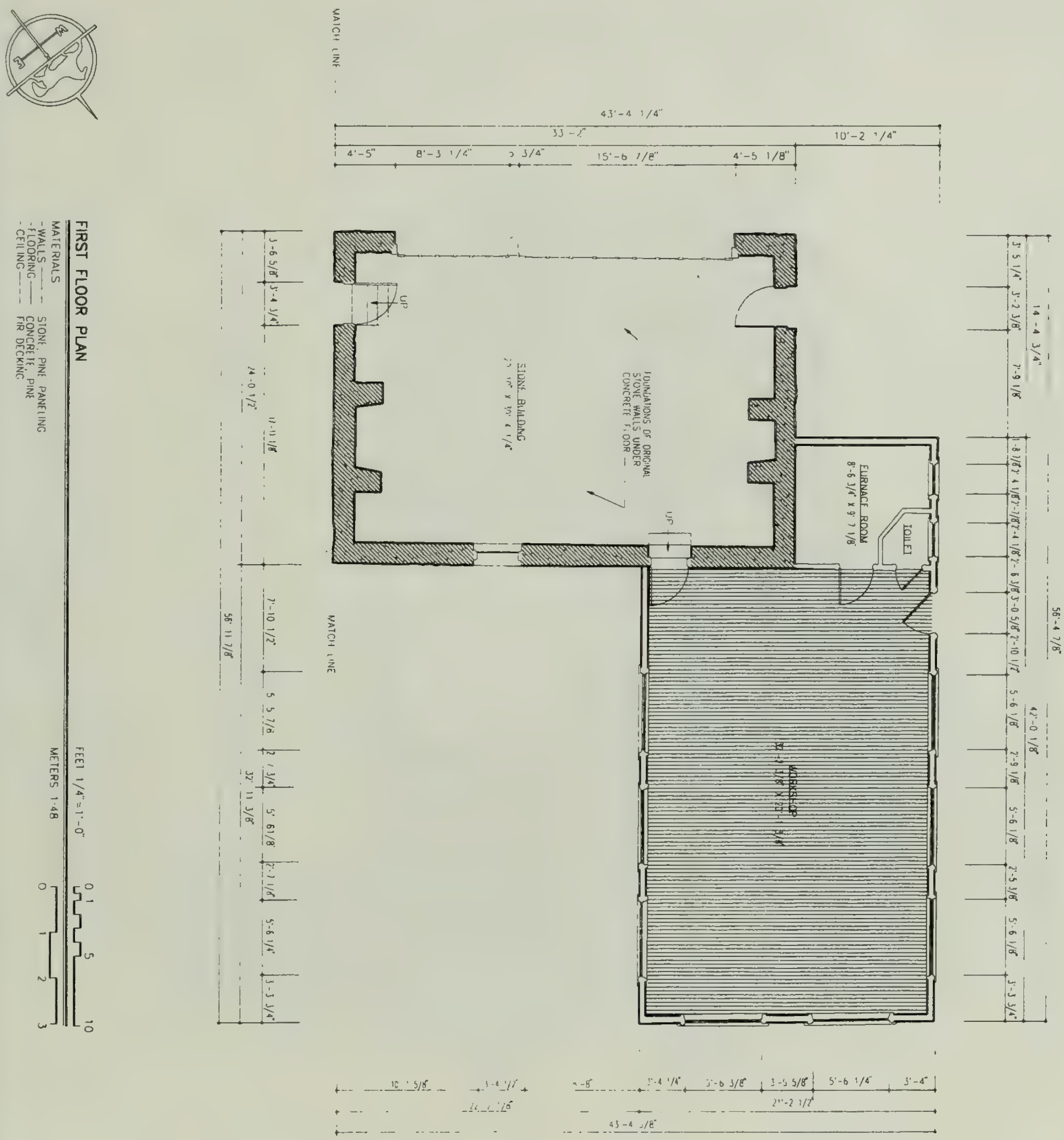
SURVEY NO.
MO-1150
ADDENDUM

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 4 OF 13 SHEETS

IF REPRODUCED PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

DRAWING SCANNED AND PLOTTED BY MANZER, SANCHEZ & ASSOCIATES, ST. LOUIS, MO (314)-567-7999

DRAWING SCANNED AND VECTORIZED BY MANZER, SANCHEZ & ASSOCIATES, ST LOUIS, MO (314)-567-7999


MATCH LINE
43'-4 1/4"
33'-2"
10'-2 1/4"
4'-5"
8'-3 1/4"
5 3/4"
15'-6 7/8"
4'-5 1/8"
STONE BUILDING
FOUNDATIONS OF ORIGINAL STONE WALLS UNDER CONCRETE FLOOR
UP
UP
FURNACE ROOM
8'-6 3/4" x 9' 7 1/8"
TOILET
WORKSHOP
MATCH LINE
14'-4 3/4"
56'-4 7/8"
42'-0 1/8"
3'-6 5/8"
3'-4 3/4"
24'-0 1/2"
17'-11 1/8"
7'-10 1/2"
56'-11 7/8"
5' 5 7/8
32' 11 3/8"
5' 61/8"
5'-6 1/4"
3'-3 3/4"
3' 5 1/4"
3'-2 3/8"
7'-9 1/8"
5'-6 1/8"
2'-9 1/8"
5'-6 1/8"
2'-5 3/8"
5'-6 1/8"
3'-3 3/4"
3'-5 5/8"
5'-6 1/4"
3'-4"
27'-2 1/2"
43'-4 5/8"
FEET 1/4"=1'-0"
METERS 1:48
0
1
5
10
0
1
2
3

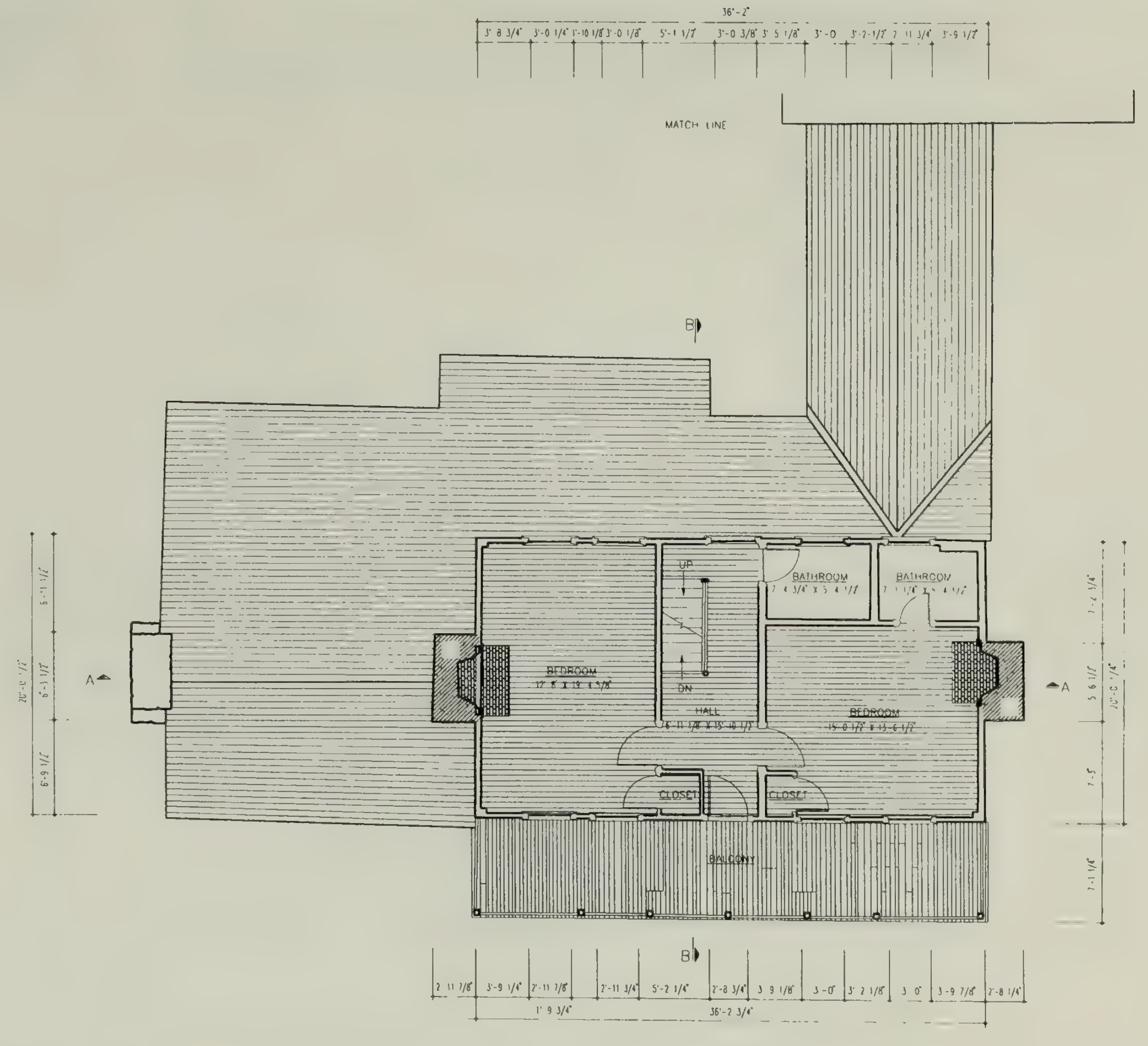
FIRST FLOOR PLAN

MATERIALS
- WALLS — STONE, PINE PANELING
- FLOORING — CONCRETE, PINE
- CEILING — FIR DECKING

DRAWN BY MANUEL E. SKOW

U. S. GRANT NATIONAL HISTORIC SITE 1991 NATIONAL PARK SERVICE UNITED STATES DEPARTMENT OF THE INTERIOR	7400 GRANT ROAD	NAME OF LOCATION OF STRUCTURE WHITE HAVEN ST. LOUIS, ST. LOUIS COUNTY	MISSOURI	SURVEY NO MO-1150 ADDENDUM	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 5 OF 15 SHEETS

IF REPRODUCED PLEASE CREDIT HISTORIC AMERICAN BUILDINGS SURVEY NATIONAL PARK SERVICE NAME OF DELINEATOR, DATE OF DRAWING


36'-2"
3'-8 3/4"
3'-0 1/4"
1'-10 1/8"
3'-0 1/8"
5'-1 1/2"
3'-0 3/8"
3'-5 1/8"
3'-0
3'-2-1/2"
2'-11 3/4"
3'-9 1/2"
MATCH LINE
MATCH LINE
B
A
A
B
BEDROOM
17'-8" x 13'-9 5/8"
UP
DN
HALL
6'-11 1/8" x 15'-10 1/2"
BATHROOM
7'-4 3/4" x 5'-4 1/2"
BATHROOM
BEDROOM
15'-0 1/2" x 13'-6 1/2"
CLOSET
CLOSET
BALCONY
20'-0 1/2"
6'-9 1/2"
6'-1 1/2"
6'-11 1/2"
7'-2 3/4"
5'-6 1/2"
7'-5
7'-1 1/4"
20'-0 1/4"
2'-11 7/8"
3'-9 1/4"
2'-11 7/8"
2'-11 3/4"
5'-2 1/4"
2'-8 3/4"
3'-9 1/8"
3'-0"
3'-2 1/8"
3'-0"
3'-9 7/8"
2'-8 1/4"
1'-9 3/4"
36'-2 3/4"

SECOND FLOOR PLAN

MATERIALS
WALLS — PLASTER ON WOOD LATH, PLASTER ON METAL LATH
FLOORING —— PINE, CERAMIC TILE
ROOF — PLASTER ON WOOD LATH, PLASTER ON METAL LATH
CEMENT ASBESTOS SHINGLES

FEET 1/4" = 1'-0"
0 1 5 10

METERS 1:48
0 1 2 3

DRAWING, SCANNING AND VECTORIZED BY: MANZER, SANCHEZ & ASSOCIATES, ST. LOUIS, MO (314)-567-7999

DRAWN BY: JEANNE F. NORGAARD
U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

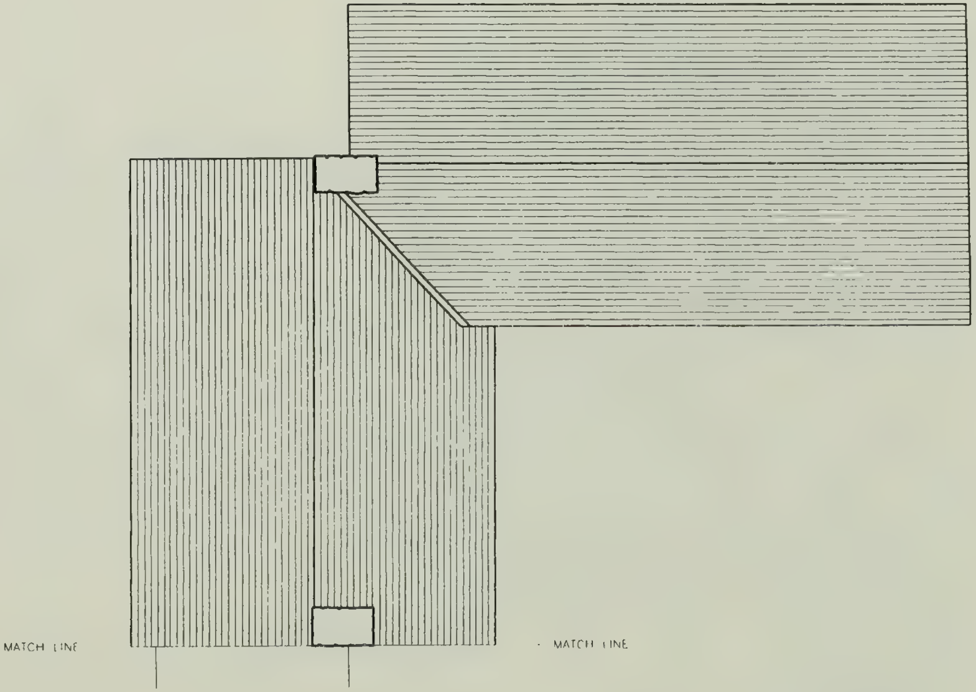
NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

MISSOURI

SURVEY NO.
MO-1150
ADDENDUM

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 7 OF 15 SHEETS



SECOND FLOOR PLAN – STONE BUILDING & WORKSHOP ROOF

FEET 1/4" = 1'-0"
0 1 5 10
METERS 1:48
0 1 2 3

MATERIALS
- ROOF —— — CEMENT ASBESTOS SHINGLES

DRAWN BY: JEANNE F. NORGAARD

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

MISSOURI

SURVEY NO.
MO-1150
ADDENDUM

HISTORIC AMERICAN
BUILDINGS SURVEY
SHEET 8 OF 15 SHEETS

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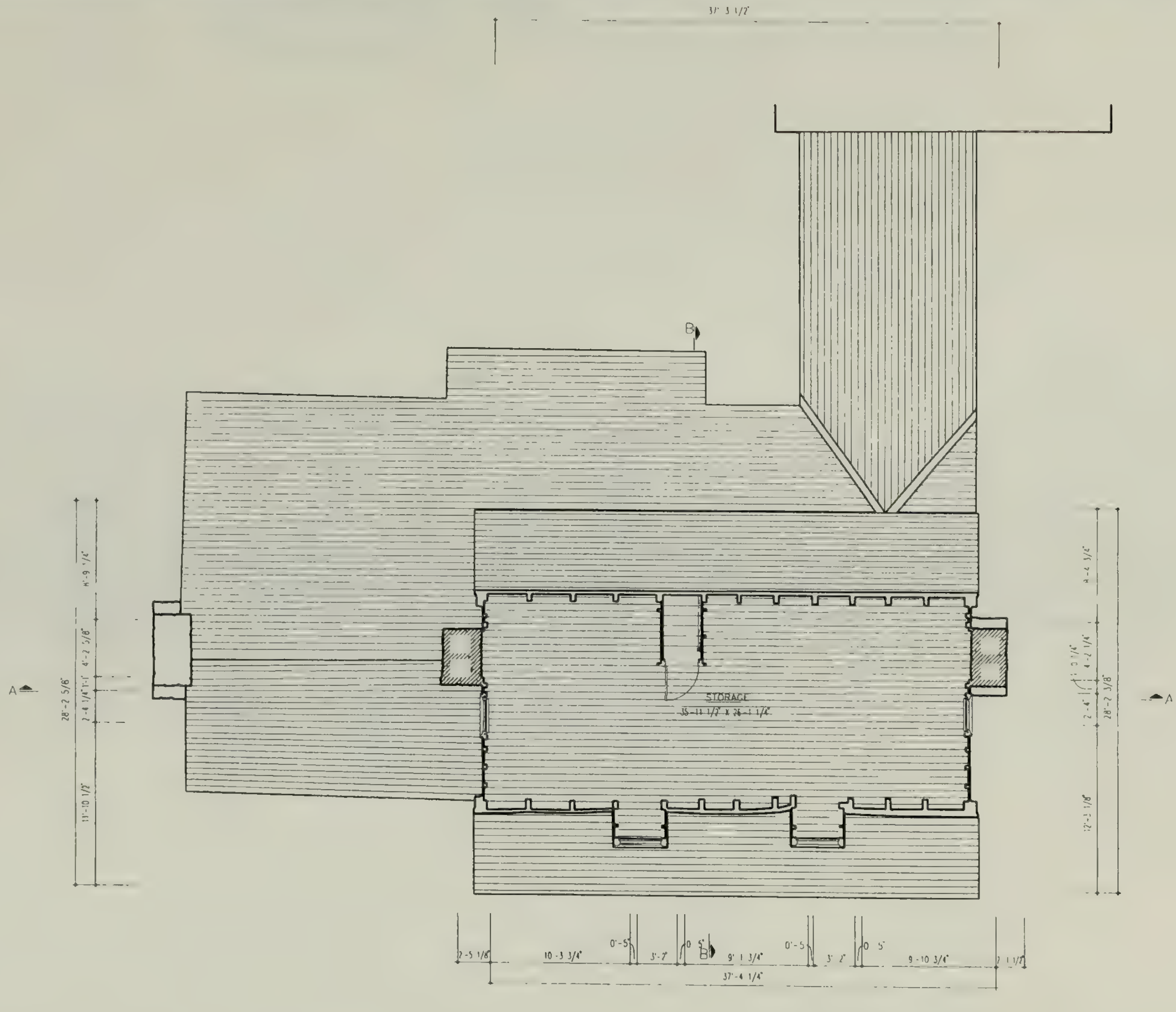

31'-3 1/2"
B
A
A
STORAGE
35'-11 1/2" x 26'-1 1/4"
11'-9 1/4"
4'-2 5/8"
2'-4 1/4"
1'-1"
28'-2 5/8"
11'-10 1/2"
4'-4 3/4"
0 3/4"
4'-2 1/4"
2'-4"
28'-2 5/8"
12'-1 1/8"
2'-5 1/8"
10'-3 3/4"
0'-5"
3'-7"
0'-5"
9'-1 3/4"
0'-5"
3'-2"
0'-5"
9'-10 3/4"
2'-1 1/2"
37'-4 1/4"

ATTIC PLAN

MATERIALS
- WALLS —— PLASTER ON LATH, HAND HEWN OAK LAP SIDING
- FLOORING —— PINE
- ROOF —— CEMENT ASBESTOS SHINGLES ON OAK AND FIR DECKING

FEET 1/4 = 1'-0"
0 1 5 10

METERS 1:48
0 1 2 3

DRAWN BY: JUDITH E. COLLINS

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

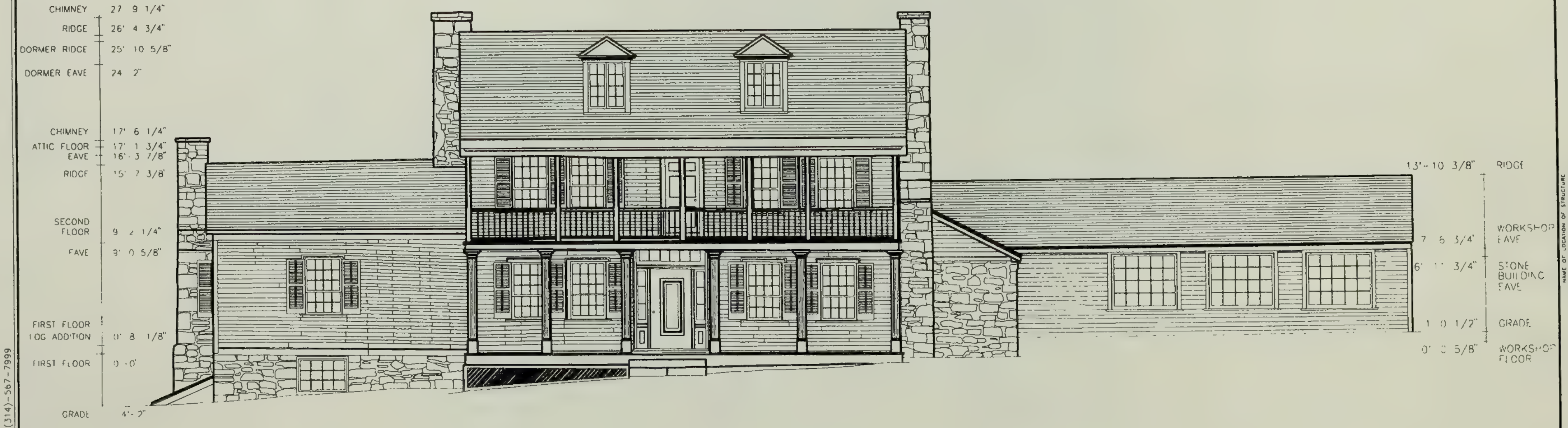
MISSOURI

SURVEY NO.
MO-1150
ADDENDUM

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 9 OF 15 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

ORIGINAL SCANNED AND VECTORIZED BY MANZER, SANCHEZ & ASSOCIATES, ST. LOUIS, MO (314)-567-7999


CHIMNEY 27' 9 1/4"
RIDGE 26' 4 3/4"
DORMER RIDGE 25' 10 5/8"
DORMER EAVE 24' 2"
CHIMNEY 17' 6 1/4"
ATTIC FLOOR 17' 1 3/4"
EAVE 16' 3 7/8"
RIDGE 15' 7 3/8"
SECOND FLOOR 9' 2 1/4"
EAVE 9' 0 5/8"
FIRST FLOOR LOG ADDITION 0' 8 1/8"
FIRST FLOOR 0'-0"
GRADE 4'-2"
13'-10 3/8" RIDGE
7' 5 3/4" WORKSHOP EAVE
6' 1" 3/4" STONE BUILDING EAVE
1' 0 1/2" GRADE
0' 0 5/8" WORKSHOP FLOOR

SOUTHEAST ELEVATION

MATERIALS:
ROOF ——— CEMENT ASBESTOS SHINGLES
- WALLS ——— HAND HEWN OAK LAP SIDING, FIR LAP SIDING
- FOUNDATION STONE, CONCRETE BLOCK, SLAB ON GRADE
CEMENT ASBESTOS SHINGLES

FEET 1/4" = 1'-0" 0 1 5 10
METERS 1:48 0 1 2 3

DRAWN BY: JEANNE F. NORGAARD

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

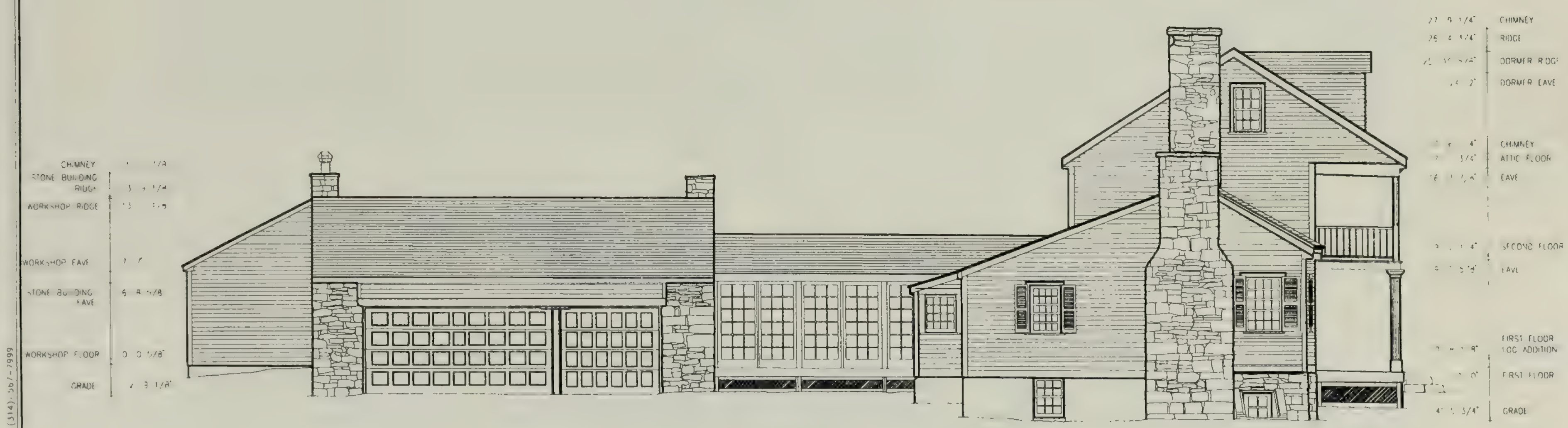
MISSOURI

SURVEY NO.
MO-1150
ADDENDUM

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 10 OF 15 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

DRAWING SCANNED AND VECTORIZED BY: MANZER, SANCHEZ & ASSOCIATES, ST. LOUIS, MO (314)-567-7999


CHIMNEY
STONE BUILDING RIDGE
WORKSHOP RIDGE
WORKSHOP EAVE
STONE BUILDING EAVE
5' 8 5/8"
WORKSHOP FLOOR
0' 0 5/8"
GRADE
3 1/8"
27' 9 1/4"
CHIMNEY
RIDGE
DORMER RIDGE
DORMER EAVE
CHIMNEY
ATTIC FLOOR
EAVE
SECOND FLOOR
EAVE
FIRST FLOOR LOG ADDITION
FIRST FLOOR
0"
GRADE
3/4"

SOUTHWEST ELEVATION

MATERIALS
ROOF — CEMENT ASBESTOS SHINGLES
WALLS — HAND HEWN OAK LAP SIDING, STONE
FOUNDATION — STONE, CONCRETE BLOCK, SLAB ON GRADE

NOTE: STONE RENDERED FROM PHOTOGRAPHS

FEET 1/4" = 1' 0" 0 1 5 10
METERS 1:48 0 1 2 3

DRAWN BY: STEVEN C. BYINGTON
U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

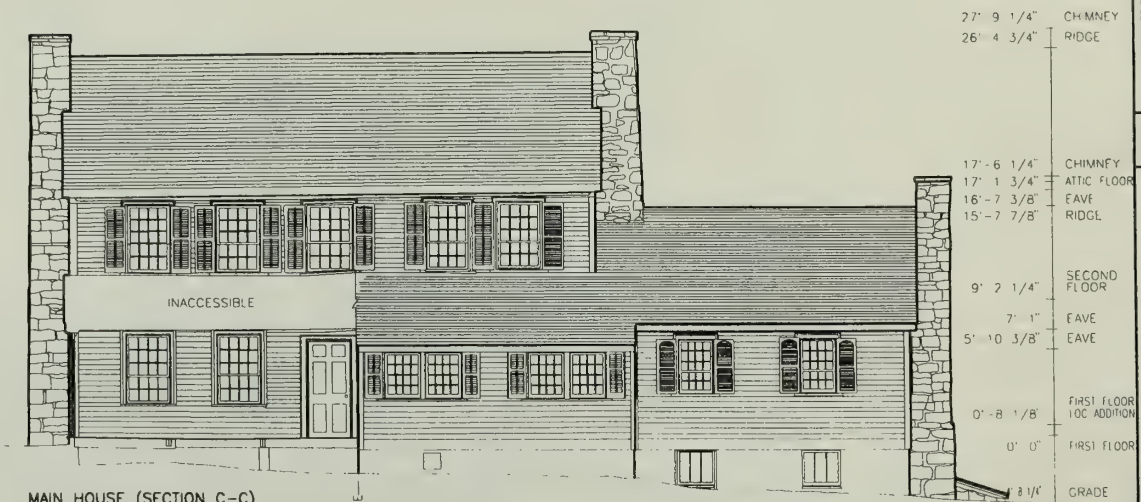
NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY
MISSOURI

SURVEY NO.
MO-1150
ADDENDUM

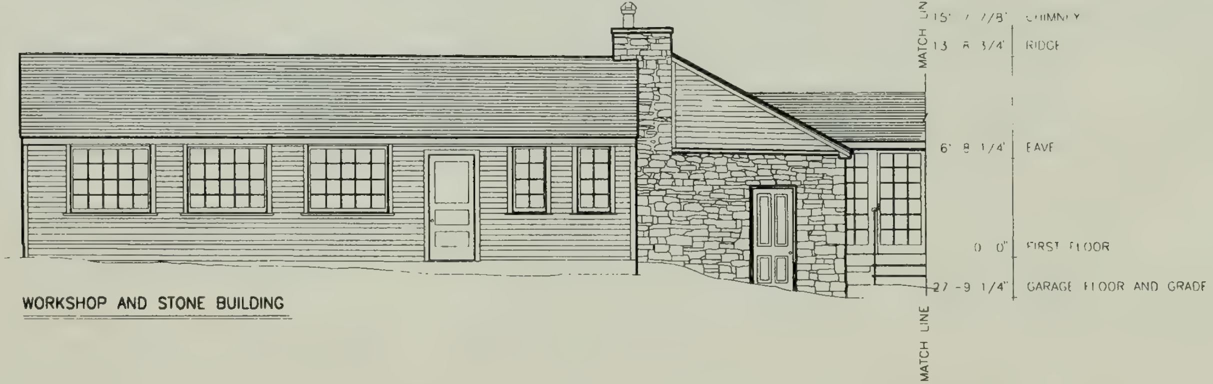
HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 11 OF 13 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

DRAWING SCANNED AND VECTORIZED BY MANZER SANCHEZ & ASSOCIATES, ST. LOUIS, MO (314)-567-7999


27' 9 1/4" CHIMNEY
26' 4 3/4" RIDGE
17'-6 1/4" CHIMNEY
17' 1 3/4" ATTIC FLOOR
16'-7 3/8" EAVE
15'-7 7/8" RIDGE
9' 2 1/4" SECOND FLOOR
7' 1" EAVE
5' 10 3/8" EAVE
0'-8 1/8" FIRST FLOOR 10C ADDITION
0' 0" FIRST FLOOR
8 1/4" GRADE
INACCESSIBLE
MATCH LINE

MAIN HOUSE (SECTION C–C)


MATCH LINE
15' 7 7/8" CHIMNEY
13 8 3/4" RIDGE
6' 8 1/4" EAVE
0 0" FIRST FLOOR
27 -9 1/4" GARAGE FLOOR AND GRADE
MATCH LINE

WORKSHOP AND STONE BUILDING

NORTHWEST ELEVATION

MATERIALS
- ROOF ——— CEMENT ASBESTOS SHINGLES
- WALLS ——— HAND HEWN OAK LAP SIDING, STONE, FIR LAP SIDING
- FOUNDATION-- STONE, CONCRETE BLOCK, SLAB ON GRADE

FEET 1/4" = 1'-0" 0 1 5 10
METERS 1:48 0 1 2 3

DRAWN BY LAURA H. LETTON

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

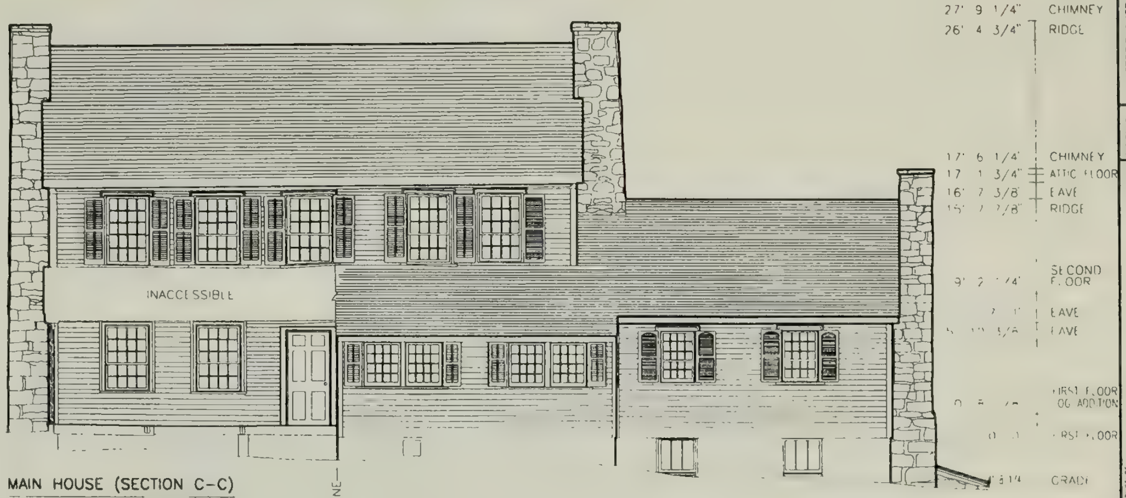
MISSOURI

SURVEY NO.
MO-1150
ADDENDUM

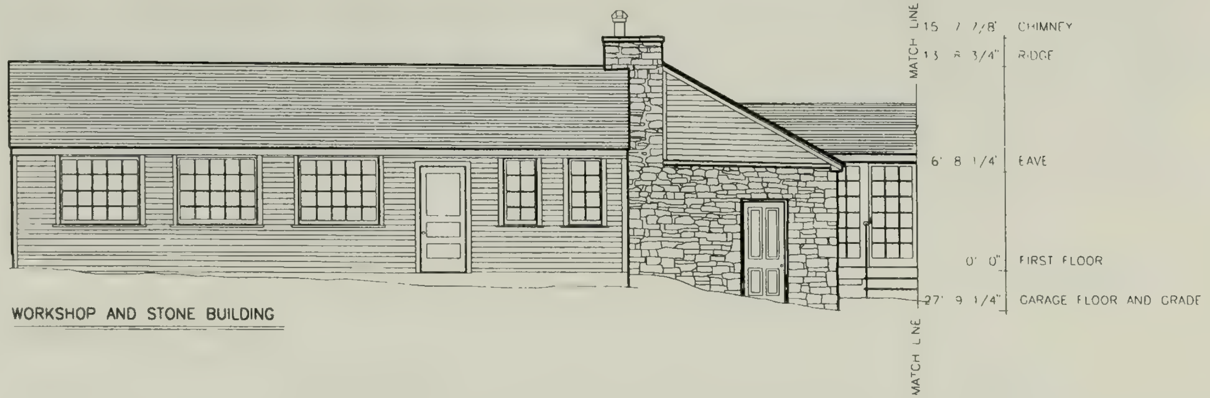
HISTORIC AMERICAN
BUILDINGS SURVEY
SHEET 12 OF 15 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

DRAWING SCANNED AND VECTORIZED BY MANZER, SANCHEZ & ASSOCIATES, ST LOUIS, MO (314)-567-7999


27' 9 1/4" CHIMNEY
26' 4 3/4" RIDGE
17' 6 1/4" CHIMNEY
17' 1 3/4" ATTIC FLOOR
16' 7 3/8" EAVE
15' 7 7/8" RIDGE
9' 2 1/4" SECOND FLOOR
7' 1" EAVE
EAVE
FIRST FLOOR LOG ADDITION
FIRST FLOOR
GRADE
INACCESSIBLE
MATCH LINE

MAIN HOUSE (SECTION C-C)


MATCH LINE
15' 7 7/8" CHIMNEY
13' 8 3/4" RIDGE
6' 8 1/4" EAVE
0' 0" FIRST FLOOR
-2' 9 1/4" GARAGE FLOOR AND GRADE
MATCH LINE

WORKSHOP AND STONE BUILDING

NORTHWEST ELEVATION

MATERIALS

ROOF	CEMENT ASBESTOS SHINGLES
WALLS	HAND HEWN OAK LAP SIDING, STONE, FIR LAP SIDING
FOUNDATION	STONE CONCRETE BLOCK, SLAB ON GRADE

FEET 1/4" = 1' 0" 0 1 5 10

METERS 1:48 0 1 2 3

DRAWN BY LAURA H. LETTON

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

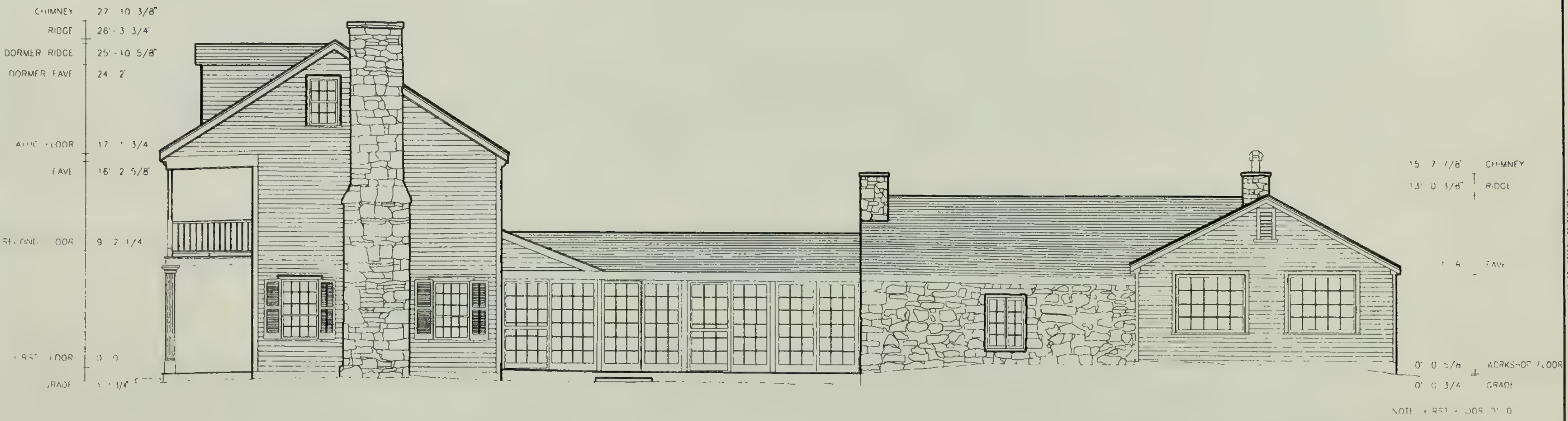
MISSOURI

SURVEY NO.
MO-1150
ADDENDUM

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 13 OF 15 SHEETS

IF REPRODUCED PLEASE CREDIT HISTORIC AMERICAN BUILDINGS SURVEY NATIONAL PARK SERVICE NAME OF DELINEATOR DATE OF DRAWING

DRAWING SCANNED AND VECTORIZED BY MANZER, SANCHEZ & ASSOCIATES, ST. LOUIS, MO (314)-567-7999


CHIMNEY 27' 10 3/8"
RIDGE 26'-3 3/4"
DORMER RIDGE 25'-10 5/8"
DORMER EAVE 24' 2"
ATTIC FLOOR 17' 1 3/4
EAVE 16' 2 5/8"
SECOND FLOOR 9' 2 1/4
FIRST FLOOR 0' 0
GRADE 1' 1/4"
15' 7 7/8" CHIMNEY
13' 0 3/8" RIDGE
EAVE
0' 0 5/8 WORKSHOP FLOOR
0' 0 3/4 GRADE
NOTE: FIRST FLOOR 0' 0

NORTHEAST ELEVATION

MATERIALS
- ROOF ——— CEMENT ASBESTOS SHINGLES
- WALLS ——— HAND HEWN OAK LAP SIDING, FIR LAP SIDING
- FOUNDATION- STONE, CONCRETE BLOCK, SLAB ON GRADE

FEET 1/4" = 1' 0"

METERS 1:48

0 1 5 10

0 1 2 3

DRAWN BY MANUEL E. SKOW

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

MISSOURI

SURVEY NO.
MO-1150
ADDENDUM

HISTORIC AMERICAN
BUILDINGS SURVEY
SHEET 14 OF 15 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

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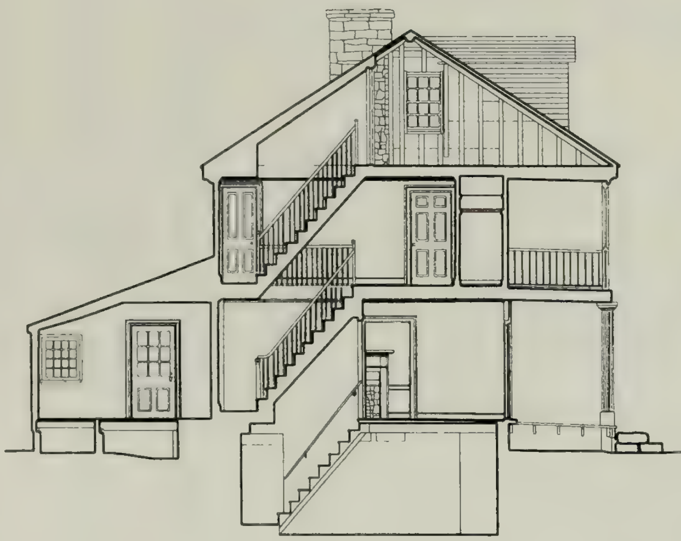
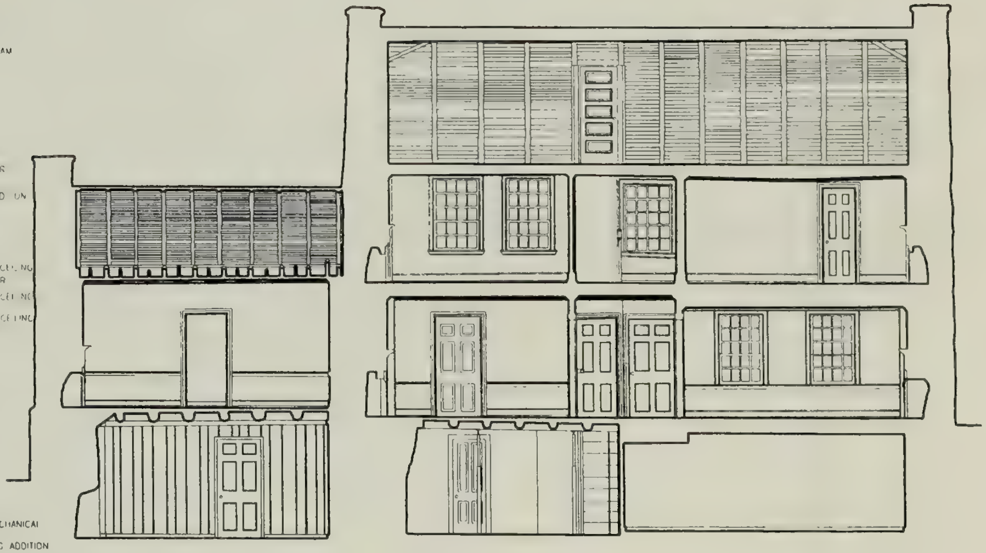


26' 4 3/4 RIDGE
25' 3 1/4 BOTTOM OF BEAM
17' 3 3/4 ATTIC FLOOR
16' 4 1/4' SECOND FLOOR CEILING
15' 7 7/8' RIDGE LOG ADDITION
9' 3 1/2' LOG ADDITION CEILING
9' 2 1/4 SECOND FLOOR
8' 1 3/4' FIRST FLOOR CEILING
7' 4' FIRST FLOOR CEILING LIVING ROOM
0' 8 1/8 FIRST FLOOR LOG ADDITION
0' 0 FIRST FLOOR
2'0 7/8 GRADE
7' 9 1/4 BASEMENT MECHANICAL
8' 1 1/4' BASEMENT LOG ADDITION



TRANVERSE SECTION "B-B" LHL

FEET 1/4" = 1'-0"

METERS 1:48

MATERIALS
ROOF ——— CEMENT ASBESTOS SHINGLES ON OAK AND FIR PLANK DECK
WALLS - - PLASTER ON WOOD LATH, PLASTER ON METAL LATH GYPSUM BOARD, STONE
FLOORING PINE, VINYL
CEILING — PLASTER ON WOOD LATH, PLASTER ON METAL LATH, GYPSUM BOARD
FOUNDATION STONE, CONCRETE BLOCK
NOTE: STONE RENDERED FROM PHOTOGRAPHS

LONGITUDINAL SECTION "A-A" SCB

FEET 1/4" = 1'-0"

METERS 1:48

MATERIALS
ROOF ——— CEMENT ASBESTOS SHINGLES ON OAK AND FIR PLANK DECKING
WALLS ——— PLASTER ON WOOD LATH, PLASTER ON METAL LATH GYPSUM BOARD, STONE
- FLOORING - PINE, CONCRETE
CEILING — PLASTER ON WOOD LATH, PLASTER ON METAL LATH, GYPSUM BOARD
FOUNDATION STONE, CONCRETE BLOCK

DRAWN BY: LAURA H. LETTON & STEVEN C. BYINGTON
U. S. GRANT NATIONAL HISTORIC SITE 1991
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
7400 GRANT ROAD
NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY
MISSOURI
SURVEY NO. MO-1150 ADDENDUM
HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 15 OF 15 SHEETS

IF REPRODUCED PLEASE CREDIT HISTORIC AMERICAN BUILDINGS SURVEY NATIONAL PARK SERVICE NAME OF DELINEATOR DATE OF DRAWING

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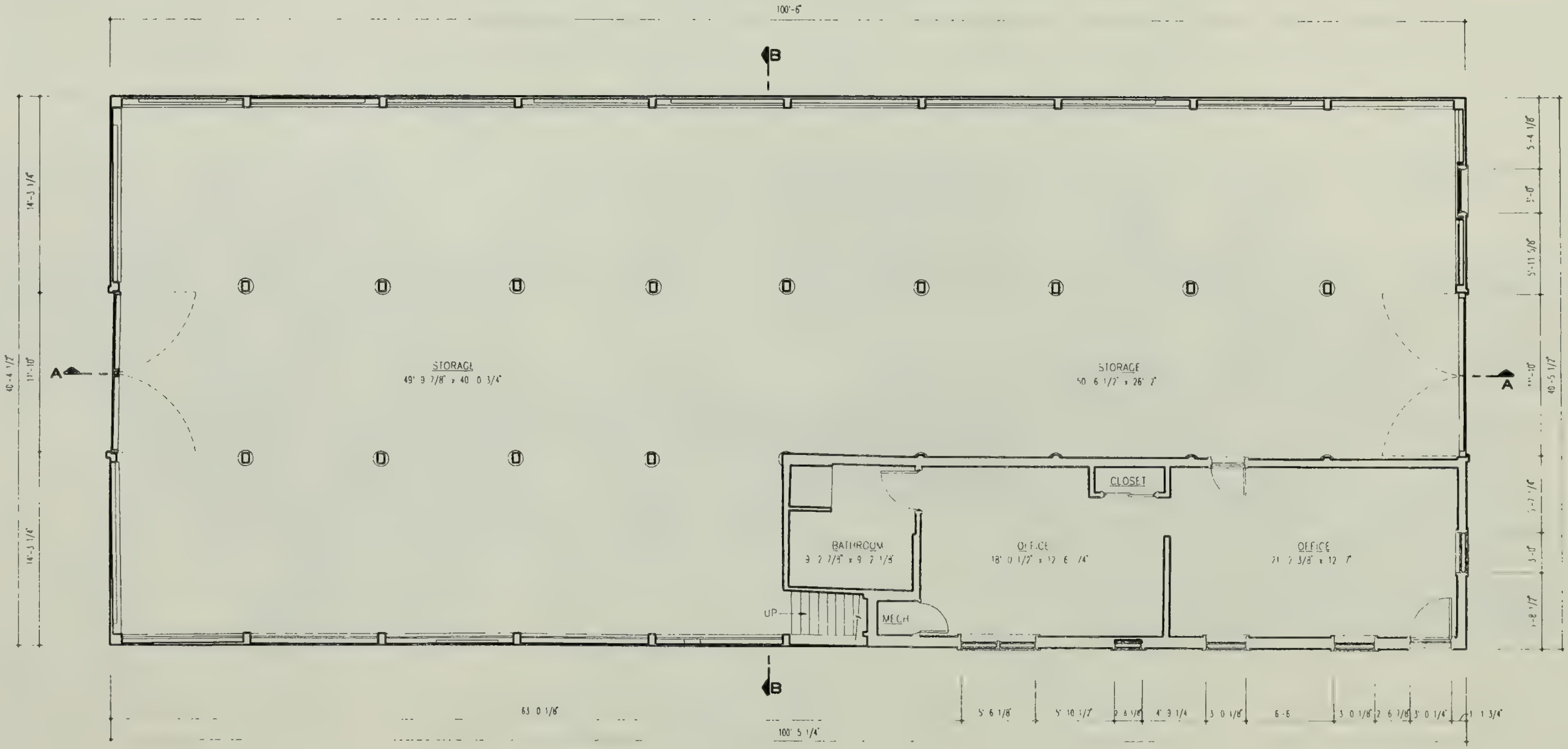
100'-6"
B
B
A
A
STORAGE
49' 9 7/8" x 40' 0 3/4"
STORAGE
50' 6 1/2" x 26' 2"
CLOSET
BATHROOM
9' 2 7/8" x 9' 2 1/8"
OFFICE
18' 0 1/2" x 12' 6 1/4"
OFFICE
21' 7 3/8" x 12' 7"
MECH
UP
40'-4 1/2"
14'-5 1/4"
11'-10"
14'-5 1/4"
40'-5 1/2"
5'-4 1/8"
5'-0"
5'-11 5/8"
11'-10"
5'-7 1/4"
5'-0"
5'-8 1/2"
63' 0 1/8"
100' 5 1/4"
5' 6 1/8"
5' 10 1/2"
2' 8 1/8"
4' 3 1/4"
3' 0 1/8"
6'-6
3' 0 1/8"
2' 6 7/8"
3' 0 1/4"
1' 1 3/4"

FIRST FLOOR PLAN

MATERIALS
- FLOORING —— CONCRETE, CARPET
- WALLS —— PLYWOOD OVER FIR PLANKS, GYPSUM BOARD, PLYWOOD

FEET 1/4" - 1'-0"
0 1 5 10
METERS 1:48
0 1 2 3

DRAWN BY: JUDITH E. COLLINS

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

MISSOURI

SURVEY NO.
MO-1150B

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 1 OF 7 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

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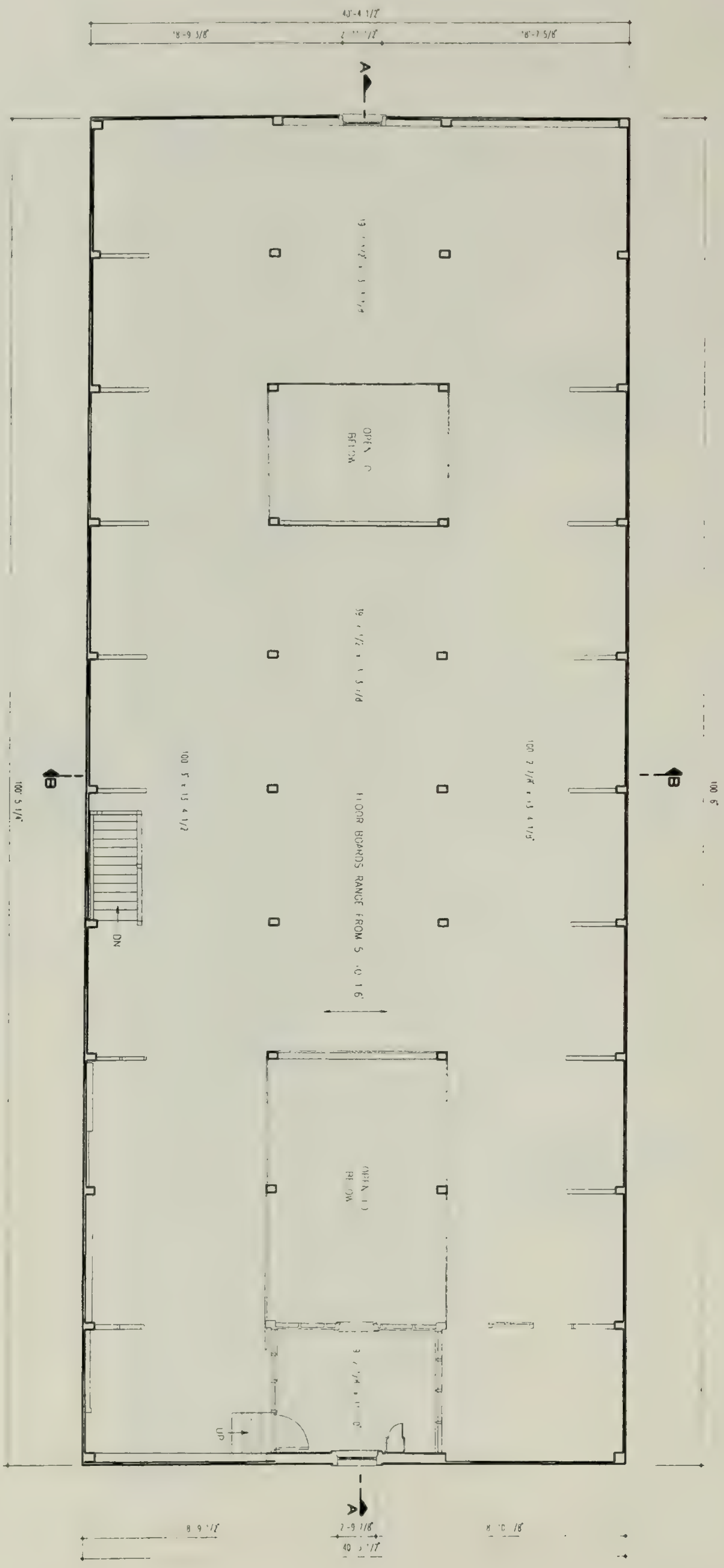

43'-4 1/2"
18'-9 3/8"
18'-7 5/8"
A
OPEN TO BELOW
FLOOR BOARDS RANGE FROM 5" TO 16"
100' 5" x 15' 4 1/2"
100' 2 7/8" x 15' 4 1/2"
B
B
100' 5 1/4"
100' 6"
DN
OPEN TO BELOW
UP
A
8' 9 1/2"
2'-9 1/8"
8' 10 1/8"
40' 3 1/2"

LOFT PLAN

MATERIALS
FLOORING — FIR PLANK DECKING
WALLS — PLYWOOD OVER FIR PLANKS

FEET 1/4" = 1' 0"
METERS 1:48
0 1 5 10
0 1 2 3

DRAWN BY JUDITH E. COLLINS, LAYRA H. LETTON; INKED BY JUDITH E. COLLINS

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

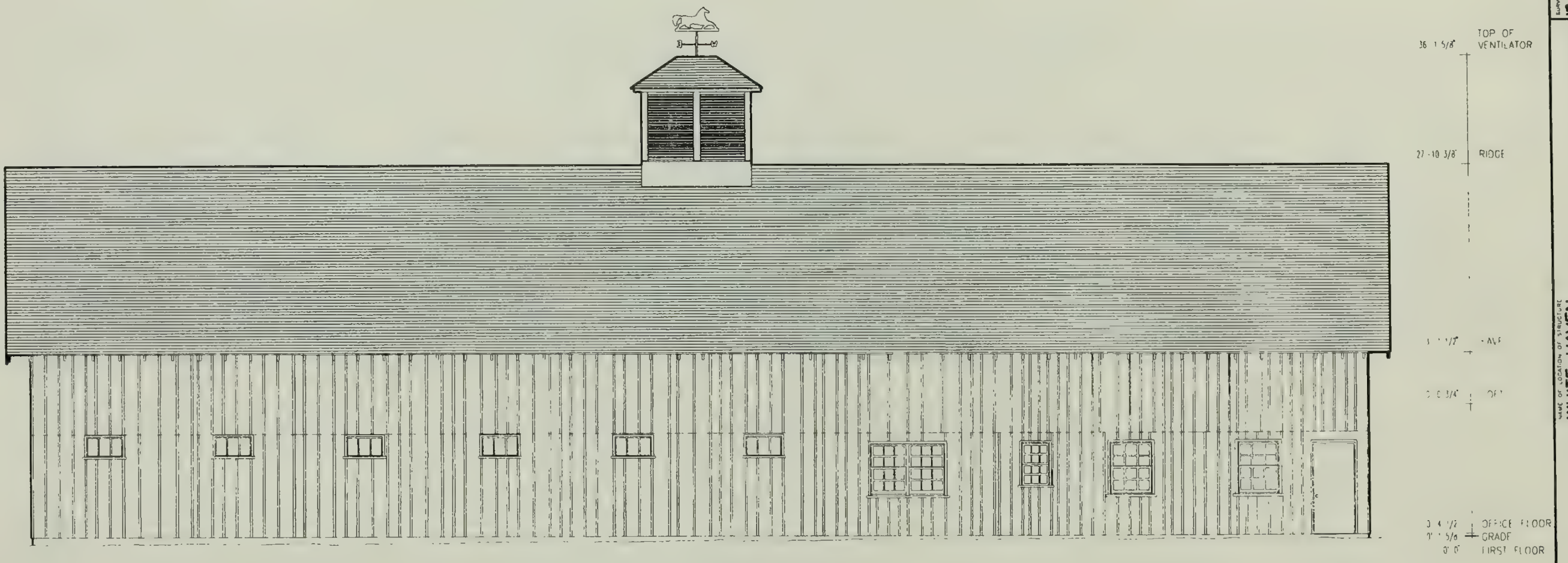
7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY
MISSOURI

SURVEY NO. MO-1150B

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 2 OF 7 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

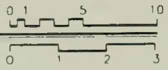


TOP OF VENTILATOR
36' 1 5/8"
27'-10 3/8"
RIDGE
EAVE
OFFICE FLOOR
GRADE
0' 0"
FIRST FLOOR

NORTHEAST ELEVATION

MATERIALS
- VENTILATOR — FIR SLATS
- ROOF — ASPHALT SHINGLES ON FIR PLANK DECKING
- WALLS — PLYWOOD OVER FIR PLANKS
- FOUNDATION — SLAB ON GRADE

FEET 1/4" = 1'-0"
METERS 1:48



DRAWN BY STEVEN C. BYINGTON

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

MISSOURI

SURVEY NO.
MO-1150B

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 3 OF 7 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

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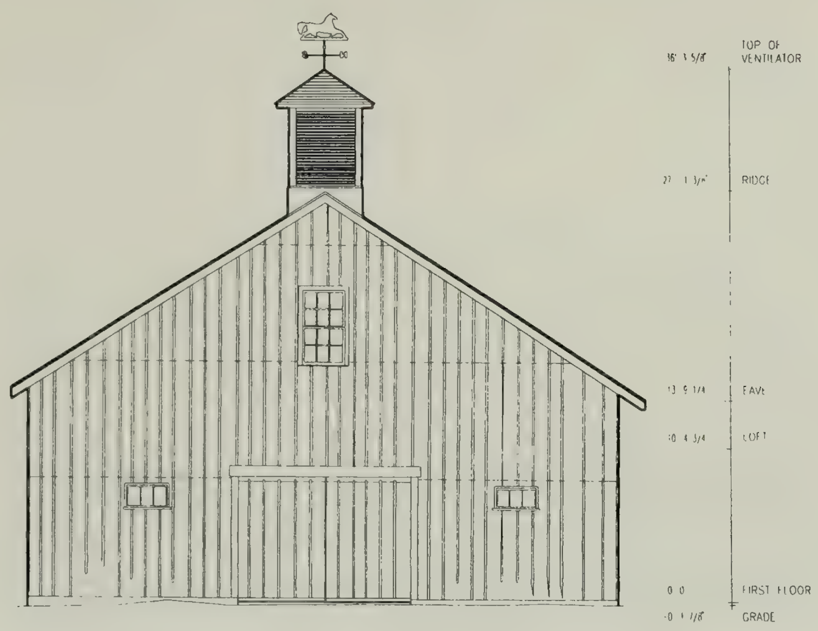
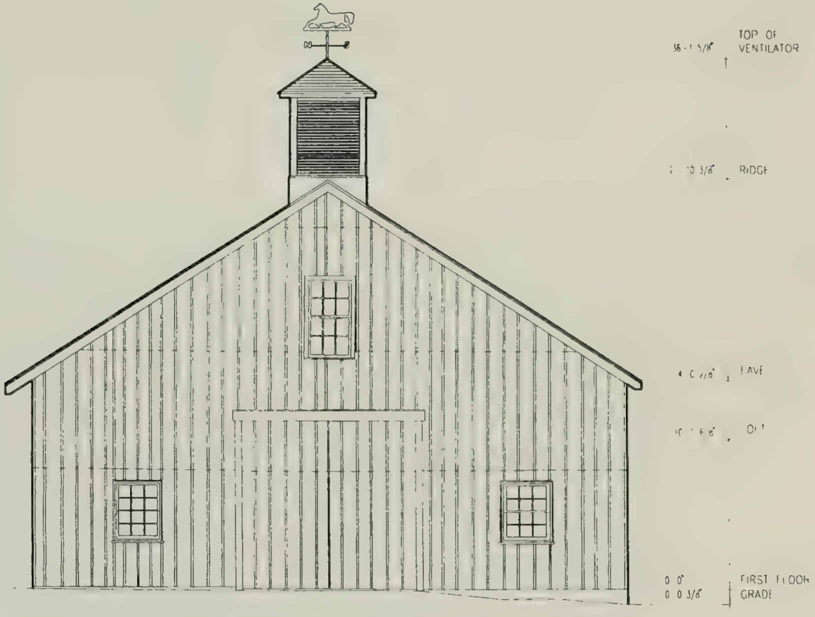

36' 1 5/8"
TOP OF VENTILATOR
27' 1 3/8"
RIDGE
13' 9 1/4
EAVE
10' 4 3/4
LOFT
0 0
FIRST FLOOR
-0' 1 7/8"
GRADE


36'-1 5/8"
TOP OF VENTILATOR
RIDGE
EAVE
LOFT
0 0"
0 0 3/8"
FIRST FLOOR
GRADE

SOUTHEAST ELEVATION

FEET 1/4" - 1'-0"
METERS 1:48

MATERIALS
- VENTILATOR — FIR SLATS
- ROOF — ASPHALT SHINGLES ON FIR PLANK DECKING
- WALLS — PLYWOOD OVER FIR PLANKS
- FOUNDATION SLAB ON GRADE

NORTHWEST ELEVATION

FEET 1/4" = 1' 0"
METERS 1:48

MATERIALS
- VENTILATOR FIR SLATS
- ROOF — ASPHALT SHINGLES ON FIR PLANK DECKING
- WALLS — PLYWOOD OVER FIR PLANKS
- FOUNDATION SLAB ON GRADE

DRAWN BY JUDITH E. COLLINS; INKED BY MANUEL E. SKOW

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

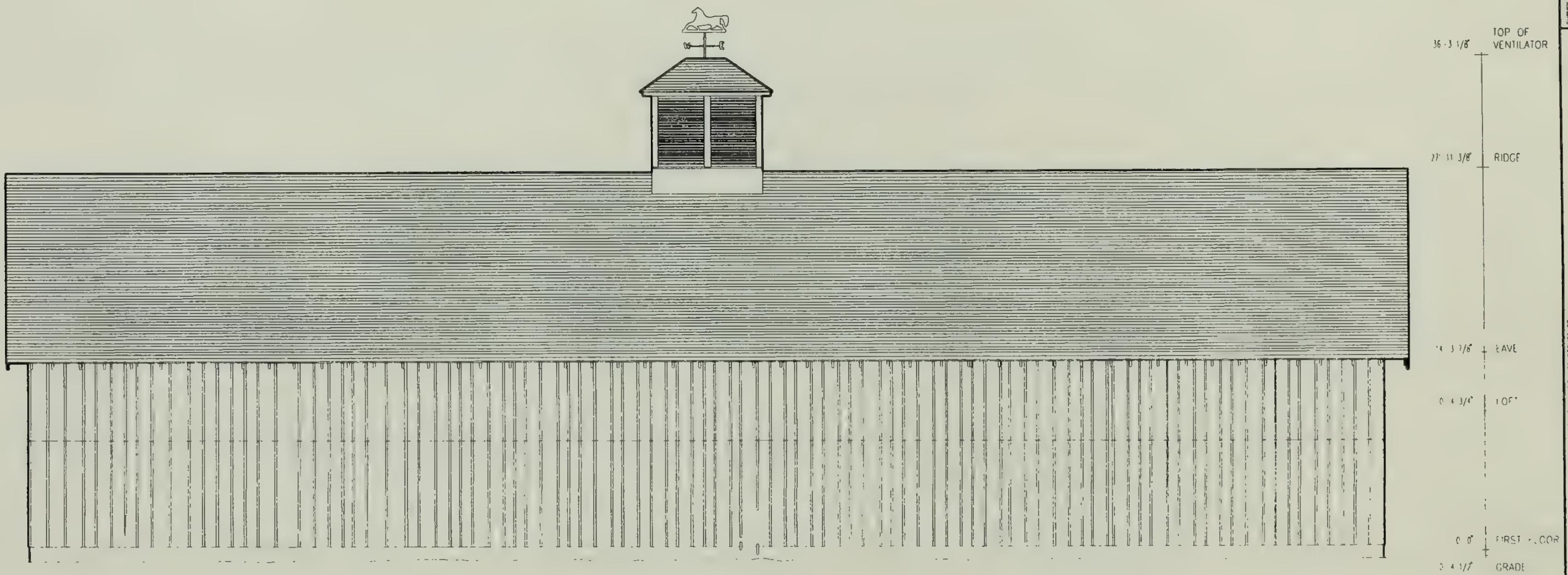
MISSOURI

SURVEY NO
MO-1150B

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 4 OF 7 SHEETS

IF REPRODUCED PLEASE CREDIT HISTORIC AMERICAN BUILDINGS SURVEY NATIONAL PARK SERVICE NAME OF DELINEATOR DATE OF DRAWING

GRAPHIC SCANNED AND VECTORIZED BY: MANZER, SANCHEZ & ASSOCIATES, ST LOUIS, MO (314)-567-7999


36'-3 1/8"
TOP OF VENTILATOR
27'-11 3/8"
RIDGE
14'-3 7/8"
EAVE
10'-4 3/4"
LOFT
0'-0"
FIRST FLOOR
0'-4 1/2"
GRADE

SOUTHWEST ELEVATION

MATERIALS
VENTILATOR — FIR SLATS
- ROOF — ASPHALT SHINGLES ON FIR PLANK DECKING
- WALLS — PLYWOOD OVER FIR PLANKS
- FOUNDATION — SLAB ON GRADE

FEET 1/4" = 1'-0"
METERS 1:48

0 1 5 10
0 1 2 3

DRAWN BY MANUEL E. SKOW

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

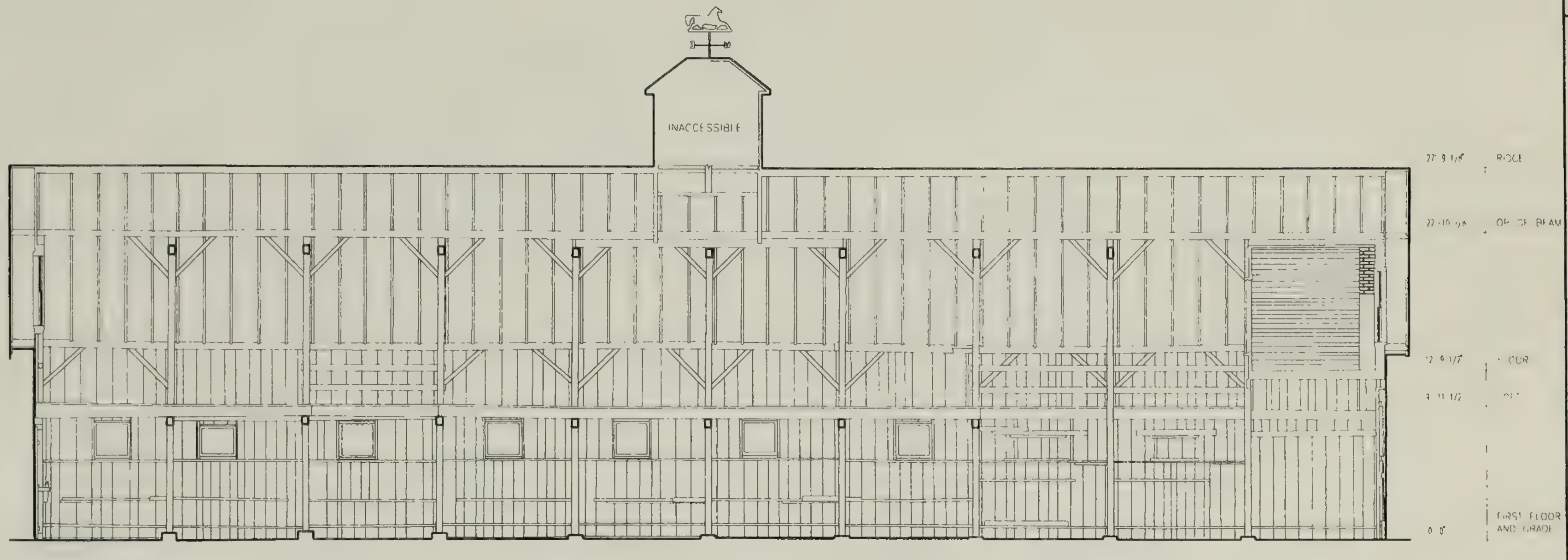
MISSOURI

SURVEY NO
MO-1150B

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 5 OF 7 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

DRAWING SCANNED AND VECTORIZED BY MANZER, SANCHEZ & ASSOCIATES, ST. LOUIS, MO. (314)-567-7999


INACCESSIBLE
27' 9 1/8" RIDGE
22'-10 1/8" OF BEAM
12' 6 1/2" COR
9' 11 1/2"
0' 0" FIRST FLOOR AND GRADE

LONGITUDINAL SECTION

MATERIALS
VENTILATOR -- FIR SLATS
- ROOF ——— ASPHALT SHINGLES ON FIR PLANK DECKING
- STRUCTURE POST AND BEAM
WALLS ——— FIR PLANKS
- FOUNDATION SLAB ON GRADE

FEET 1/4" - 1'-0"
0 1 5 10
METERS 1:48
0 1 2 3

DRAWN BY JEANNE F. NORGARD

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

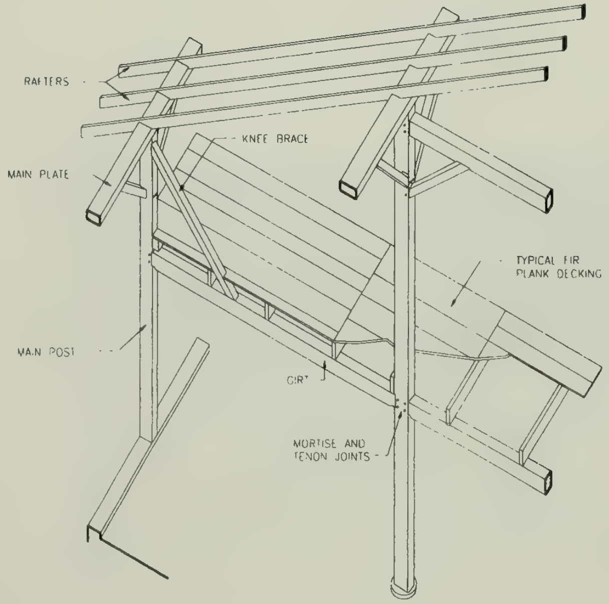
MISSOURI

SURVEY NO.
MO-1150B

HISTORIC AMERICAN
BUILDINGS SURVEY
SHEET 6 OF 7 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

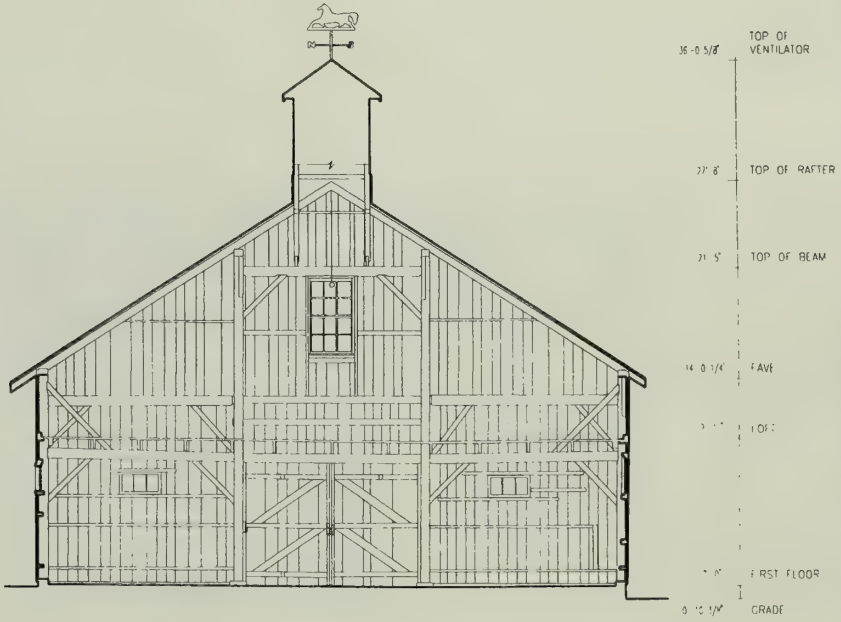
DRAWING SCANNED AND VECTORIZED BY MANZER, SANCHEZ & ASSOCIATES, ST. LOUIS, MO (314)-567 7999


RAFTERS
KNEE BRACE
MAIN PLATE
TYPICAL FIR PLANK DECKING
MAIN POST
GIRT
MORTISE AND TENON JOINTS

AXONOMETRIC OF ONE BRACE BENT

(TYPICAL)

FEET 3/8" = 1'-0" 0 1 5
METERS 1:32 0 1 2


36'-0 5/8" TOP OF VENTILATOR
27' 8" TOP OF RAFTER
21' 5" TOP OF BEAM
14' 0 1/4" EAVE
LOFT
FIRST FLOOR
0' 10 1/4" GRADE

TRANSVERSE SECTION "B-B"

FEET 1/4" = 1'-0" 0 1 5 10
METERS 1:48 0 1 2 3

MATERIALS:
- VENTILATOR —— FIR SLATS
- ROOF ——— ASPHALT SHINGLES ON FIR PLANK DECKING
- STRUCTURE — POST AND BEAM
- WALLS ——— FIR PLANKS
- FOUNDATION — SLAB ON GRADE

DRAWN BY MANUEL E. SKOW

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

MISSOURI

SURVEY NO.
MO-1150B

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 7 OF 7 SHEETS

IF REPRODUCED, PLEASE CREDIT: HISTORIC AMERICAN BUILDINGS SURVEY, NATIONAL PARK SERVICE, NAME OF DELINEATOR, DATE OF DRAWING

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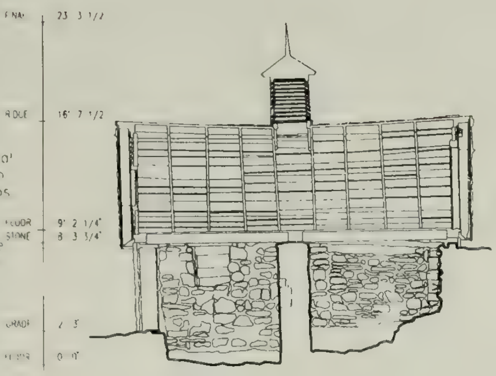
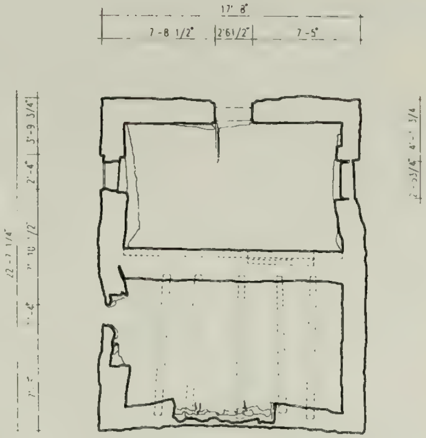
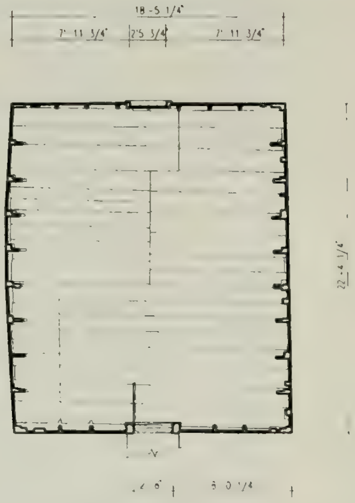
This structure, constructed prior to 1875, is set into the hill north of the main house and overlooks a creek. Its original use is not clear. Two features suggest that the structure may have served as a smokehouse, nonstructural logs at the ceiling of the south room and the presence of a cupola. The structure's foundation consists of perimeter and inner walls of rubble limestone bedded in sand and lime mortar. The ground floor is dirt. The upper frame and floorboards are vertical and circular sawn white pine resting on a log sill. The roof consists of asbestos cement shingles laid over roll roofing and board sheathing. The wood floor and fixed eight pane sash window were added from salvaged materials during the 1960's. The addition of the floor separated the building into two levels and sealed the southern half of the ground level. Tree roots penetrating the south side of the structure have collapsed the inner wythe of that wall



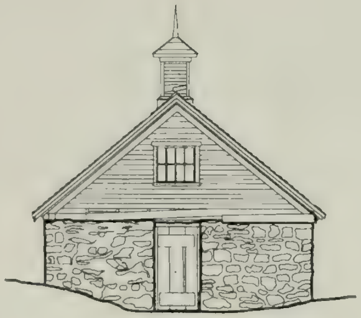
LONGITUDINAL SECTION



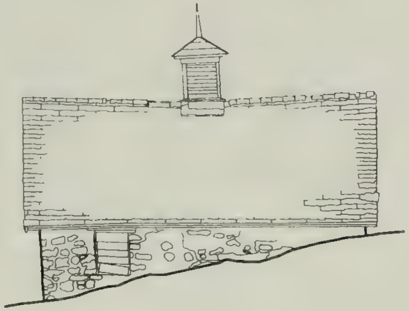
FOUNDATION PLAN



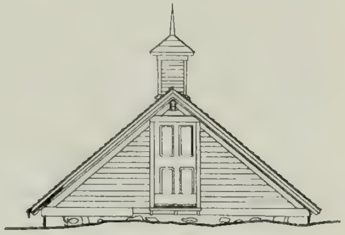
FIRST FLOOR PLAN



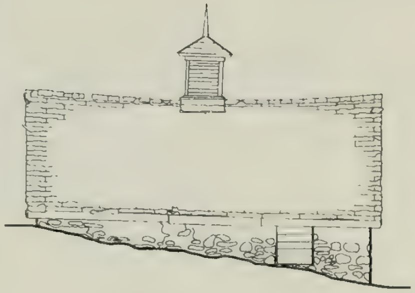
NORTHWEST ELEVATION



SOUTHWEST ELEVATION



SOUTHEAST ELEVATION



NORTHEAST ELEVATION

OUTBUILDING

FEET 1/4"=1'-0"
0 1 5 10

METERS 1:48
0 1 2 3

DRAWN BY LAURA M. JOHNSON

U. S. GRANT NATIONAL HISTORICAL SITE 1992
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

7400 GRANT ROAD

NAME OF STRUCTURE
WHITE HAVEN
ST. LOUIS, ST. LOUIS COUNTY

MISSOURI

SURVEY NO.
MO-1150D

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 1 OF 1 SHEETS

IF REPRODUCED PLEASE CREDIT HISTORIC AMERICAN BUILDINGS SURVEY NATIONAL PARK SERVICE NAME OF DELINEATOR DATE OF DRAWING

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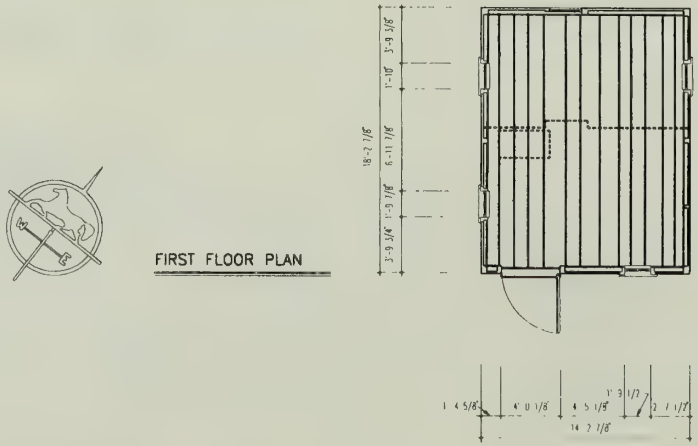
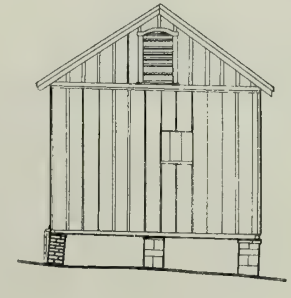
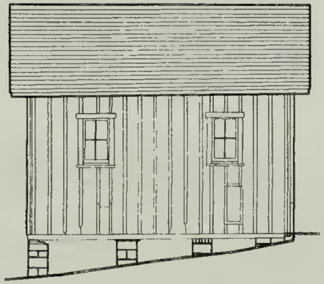

3'-9 3/4"
1'-9 7/8"
6-11 7/8"
1'-10"
3'-9 3/8"
18'-2 7/8"
1 4 5/8"
4' 0 1/8"
4 5 1/8"
1' 9 1/2
2 7 1/2"
14 2 7/8"

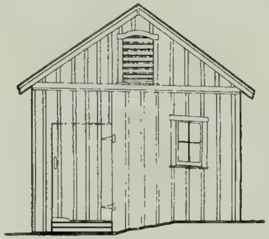
FIRST FLOOR PLAN



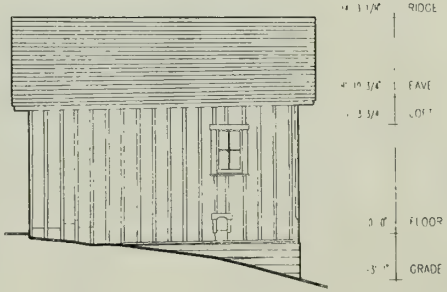
NORTHWEST ELEVATION



SOUTHWEST ELEVATION



SOUTHEAST ELEVATION


14' 3 1/4"
RIDGE
4' 10 3/4"
EAVE
3 3/4
LOFT
0' 0"
FLOOR
-3'
GRADE

NORTHEAST ELEVATION

SHED

MATERIALS
ROOF ——— CEMENT ASBESTOS SHINGLES ON FIR PLANK DECKING
- WALLS ——— FIR BOARD AND BATTEN SIDING ON FIR STUDS
FLOORING ——— FIR PLANK DECKING
FOUNDATION - BRICK, CONCRETE BLOCK

FEET 1/4" - 1' 0" 0 1 5 10
METERS 1 48 0 1 2 3

DRAWN BY JEANNE F. NORGARD AND MANUEL E. SKOW; INKED BY JEANNE F. NORGAARD

U. S. GRANT NATIONAL HISTORIC SITE 1991
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

NAME OF LOCATION OF STRUCTURE
WHITE HAVEN
7400 GRANT ROAD
ST. LOUIS, ST. LOUIS COUNTY
MISSOURI

SURVEY NO
MO-1150C

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 1 OF 1 SHEETS

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